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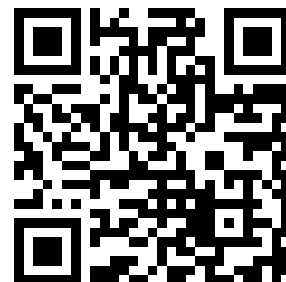
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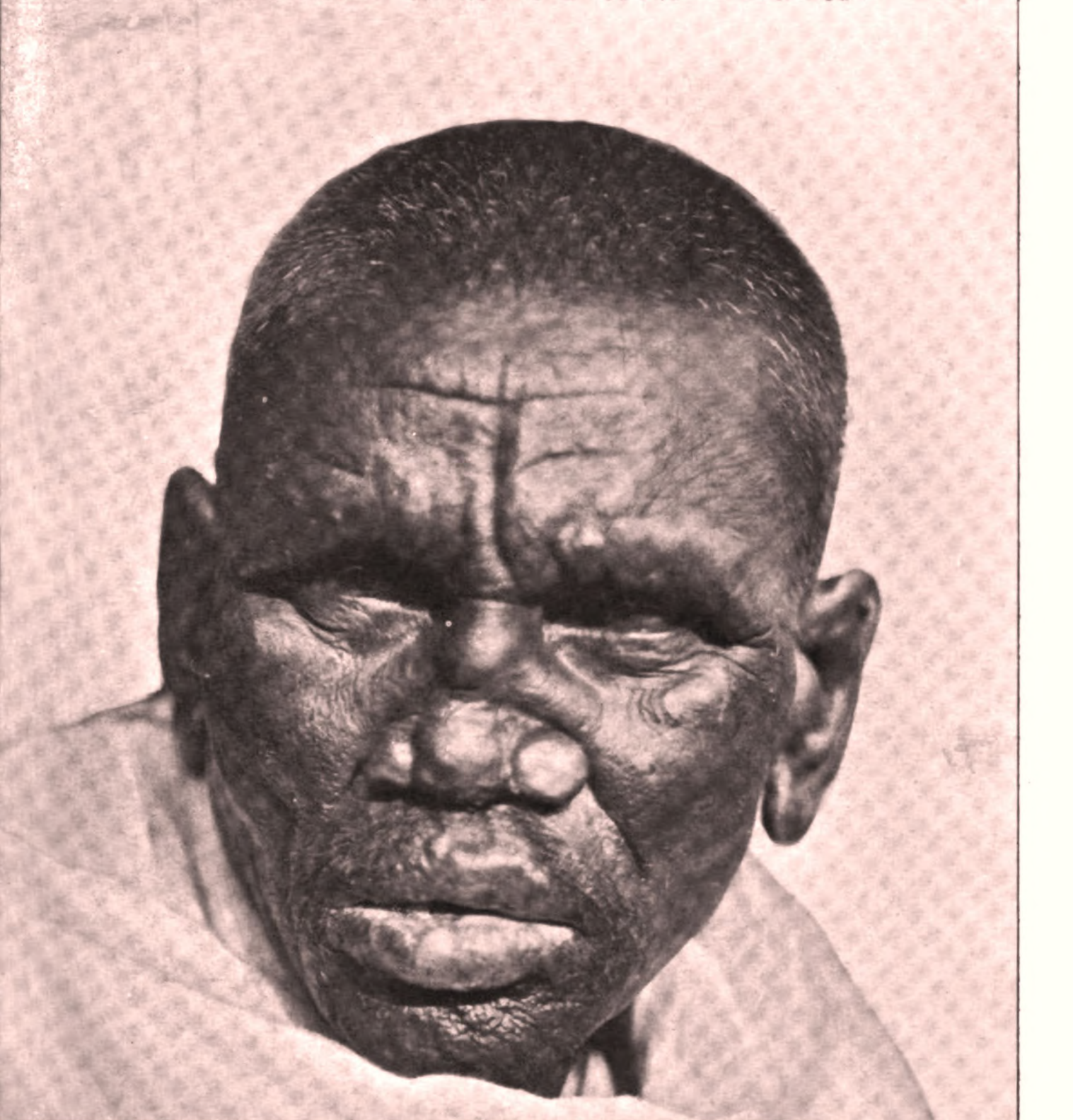
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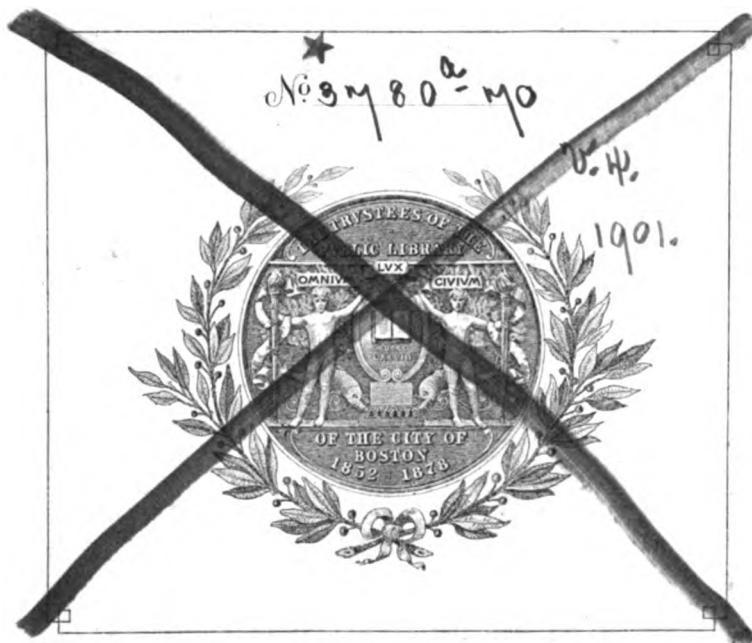


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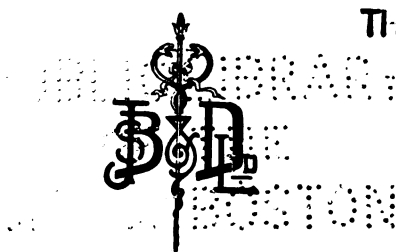
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EDITED BY

JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D., F.R.C.P.

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 Boyé, Dr.
 Braddon, W. Leonard, F.R.C.S.
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 Calandrucchio, Sauveur, Dr.
 Cantlie, James, M.B., F.R.C.S.
 Celli, Angelo, Professor.
 Cook, Albert R., B.A., M.B., B.Sc.
 Cook, J. Howard, M.S., M.B., F.R.C.S.
 Cousland, P. S., M.D.
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 Crombie, A., M.D., Col. I.M.S.
 Cropper, I., M.B., B.C.
 Dalgetty, A. B., M.B., C.M.
 Daniels, C. W., M.B.
 Darier, Dr.
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 Drake, Brockman, H. E., F.R.C.S.I.
 Duncan, Andrew, M.D., B.S., M.R.C.P., F.R.C.S.
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 Freyer, P. Johnston, M.A., M.D., B.Ch., R.U.I.
 Galloway, David J., M.D., M.R.C.P.
 Gibson, R. MacLean, M.D., C.M.
 Giles, G. M., M.B., F.R.C.S., Lieut.-Col. I.M.S.
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* 3780.2 = 70

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REPORT ON A GLANDULAR AILMENT WHICH PREVAILED AT BACALAR CHICO, IN FEBRUARY AND MARCH, 1900.

By C. H. EYLES.

Colonial Surgeon, Belize, British Honduras.

[We are indebted to the courtesy of the Secretary of the State for the Colonies for the permission to publish this valuable observation and report. —Ed. *Jl. T. M.*]

IN consequence of a report received early in March, to the effect that a febrile affection with glandular swellings was prevalent at Bacalar Chico, Assistant Colonial Surgeon Harrison was directed to visit the place and make enquiries. He visited the place on March 10, and made a house to house inspection. He describes the place as a "fishing settlement at the north end of Ambergris Cape, consisting of about a score of houses and containing about sixty souls." At the time of his visit there were no cases in actual progress, so he refrained from giving any diagnosis. But on enquiry he learned that during the three preceding weeks nine persons out of the sixty had suffered from an affection in which there was fever for about three days, followed by glandular enlargements, chiefly in the neck. He looked upon the matter "with suspicion," and suggested that the place should be "inspected from time to time." Assistant Colonial Surgeon Gann, in whose district this place is situated, was accordingly directed to visit and report.

Dr. Gann visited the place on March 18. He ascertained that there had been thirteen cases in all. I append the list, giving them in the order of occur-

rence, so far as can be ascertained. Dr. Gann found three cases in which there was still some amount of glandular swelling. In two the enlargement was barely susceptible, in the third the "symptoms were well marked." None of these glands were aspirated. Commenting on these cases, Dr. Gann stated:—"There can be no doubt that, taken in conjunction with a number of similar cases, which have recently occurred in Corosal, this outbreak must be looked upon with grave suspicion," and he added that, "the more intelligent persons with whom he conversed at Bacalar Chico, expressed their opinion that the disease had been introduced from higher up the Mexican Coast, where it was reported to be prevalent at some of the settlements."

In the meantime in response to enquiries made by me, Dr. Gann reported four cases as occurring at Corosal up to March 17. On March 20, he reported two further cases from Corosal, and on March 28, he reported that two days after his return from Bacalar Chico he himself had an attack of the same affection.

Dr. Gann is the only medical officer who has actually seen any case in progress. His actual observation bears out what has been gathered as to the nature of the cases, viz.: that after some febrile disturbance lasting for about three days, glandular enlargements, chiefly of the cervical glands, appeared. Unfortunately no material from any of the glands was forwarded for examination; and no cases occurred after I drew attention to this point and requested that cover glass films of fluid obtained by aspiration might be sent me.

Whilst these events were occurring at Bacalar Chico and Corosal, a case was reported to me in Belize by Dr. Harrison, as occurring in a man from Northern River. Dr. Harrison reported that there

was a swelling in the right groin the size of a tangerine orange, spherical in shape and situated below Poupart's ligament. He added that "after careful enquiry he found it was not of venereal origin, nor sympathetic, but in his opinion, idiopathic." Others at the same place were reported to be suffering from the same complaint. In this case some pus from the bubo was supplied. Microscopic examination showed only the ordinary organisms of suppuration.

As to the nature of this complaint, I am unable to express any opinion. The sudden appearance at the present time of a glandular ailment, with febrile phenomena, in any settlement, and attacking about 20 per cent. of the people (as in Bacalar Chico) is strongly suggestive of plague. The possibility of importation of this disease is by no means remote; for at the time the disease was prevalent at Rio de Janeiro, from which place vessels in ballast arrive at Belize and the adjacent Yucatan Peninsula for cargoes of logwood. If the disease was plague then it must have been of a mild type, and being introduced in a sparsely populated country died out. I may add that no special mortality of rats, &c., was observed.

LIST OF CASES REFERRED TO BY DRS. HARRISON AND GANN IN THEIR REPORTS ON THE GLANDULAR AILMENT PREVALENT AT BACALAR CHICO.

No.	Approximate Date of Onset	Name	Age (years)	Sex	Position of Affected Glands
1	13 Feb.	Petrona Munoz ..	16	F.	Inguinal and popliteal
2	18 "	Matilda Zetina ..	31	F.	Cervical and sub-maxillary
3	25 "	Ignacio Aguinedo ..	20	M.	Cervical
4	27 "	John Gabourel ..	30	M.	Cervical
5	28 "	Florencio Sansares ..	35	M.	Submaxillary
6	28 "	Pedro Gonzales ¹ ..	70	M.	Cervical
7	28 "	Paulita Camera ..	16	F.	Cervical
8	1 Mar.	Pablo Catsin ..	..	M.	Cervical and sub-maxillary
9	6 "	Catalina Mansania ..	2	F.	Parotid
10	16 "	Paulita Catsin ..	..	F.	Cervical
11	..	Three persons absent	..	..	..
12	..	when the officers	..	..	..
13	..	visited	..	..	..

¹ Had also chronic inflammation of axillary glands.

STRIKING CONFIRMATION OF MOSQUITO-BORN MALARIAL INFECTION IN A CHILD AGED THREE WEEKS.

By DR. J. C. GRAHAM.
Deli, Sumatra.

THE child in question greatly alarmed its parents by suddenly developing a rise of temperature that could not be accounted for by any of the usual causes. In response to the question whether the child had suffered much from mosquito bites, the parents replied it was usually well looked after to prevent their occurrence, but that ten days previously the native servant had carelessly forgotten to close the mosquito-curtains at night, with the result that the child was simply covered with mosquito bites the following morning.

The irritation caused by these soon passed off and the incident was forgotten.

Acting on this information I examined the blood of the infant, and found the malarial parasite.

The fever yielded readily to quinine inunction.

TYPHUS-LIKE, ERYTHEMATOUS AND OTHER ERUPTIONS IN PLAGUE.

By WM. HOSSACK, M.D.
Calcutta.

In the scanty clinical accounts we possess of the early pandemics of plague, references are occasionally met with that suggest that, in the past, eruptions were of not uncommon occurrence. Thus Gibbon, who relies on Procopius, writing on the pandemic of the sixth century, says that "the bodies of the sick were often covered with black pustules or carbuncles, the symptoms of immediate death; and in the constitutions too feeble to produce an eruption, the vomiting of blood was followed by a mortification of the bowels."¹ In the great plague of the seventeenth century Boghurst, in a description of the plague of London, mentions "spots of various colours" among the symptoms.² In the present pandemic at least, eruptions have been so uncommon and so little marked that one finds practically no reference to them. Dr. Cantlie in his article on the spread of plague says that "petechial eruptions may be found in plague, but the eruptions met with in the Hong Kong epidemic were never characteristic, though many cases showed spots on the skin"—in fact most of the spots were apparently mosquito bites. In a later paper he describes the following *post-mortem* appearances: "On the skin of a person dead of plague may be found petechiæ here and there; and over the bubo itself and on the limb on which the bubo develops, dusky patches, sometimes punctate, but more often irregular in outline, are met with, causing the skin to appear mottled. A rash resembling the eruption of typhus is very occasionally met with."³ It is not clear whether this refers to his personal experience in Hong Kong. In all the recent reports on epidemics in India the only reference I can find is a negative one. Thompson says, "An eruption of the skin of any distinctive character although frequently looked for, was not found. In a few cases, at most, fugitive erythematous, or urticarial rashes, or mosquito bites, or lichen tropicus, were discovered. Sudamina were rarely seen; purpura spots, vibices and desquamation were conspicuous by their absence."⁴

In Poona in the 1897-1898 epidemic I cannot recall an eruption or rash of any sort, and in Calcutta all along they have been of the rarest occurrence. In addition to the two cases to be described in detail, I have only met once with a profuse and universal sudaminous eruption, not to speak of twice getting histories of a similar occurrence, and only once have I seen the petechial eruption which is so frequently referred to generally, but which so few observers seem actually to have seen. Dr. K. C. Rose showed me this interesting case, the notes of which are as follows:—

"A very large swelling extends up and down the right side of the back from the midscapular to the lumbar region, oval in shape, about one inch in depth, and 12 to 15 inches long. It developed yesterday with great rapidity, and is apparently due to deep intermuscular hæmorrhage. The skin over the lower part of the swelling is reddened, puckered, rather brawny and erythematous. In the upper half the skin over it is normal unless for round black spots $\frac{1}{4}$ in. to $\frac{1}{2}$ in. in diameter, not raised at all, but black hæmorrhagic staining. The petechiæ are confined to the skin over the swelling, and the limbs, head and the rest of the trunk are quite free. In the lower half these spots are very scanty. The patient is dying, with the hands and feet already cold. There is no swelling of the glands. This is the fourth day of illness."

The experience of my colleagues agrees with my own, and none of them can recall a single case showing a general eruption of any kind, though they have occasionally met petechiæ, bullæ and the like on or around the bubo, or on the limb below the bubo. Dr. Pearse, whose experience has to do mainly with plague seen in Bombay, informs me that while he has never seen a general eruption of any description, he has occasionally seen a few sparse bullæ of various sizes on or around the bubo, but chiefly on the limb having the bubo. He has examined some of these bacteriologically, but they only contained staphylococci. Petechiæ are also uncommon, but he has occasionally seen them on or around a bubo or carbuncle, passing once or twice into a condition resembling *post-mortem* hypostatic discolouration. Dr. Pettifer and Dr. Justice have only once or twice seen petechiæ, and in addition the latter once has seen a crop of pustules on the limb under the bubo.

The first of the two cases that follow below is sufficiently interesting to justify a somewhat detailed account as, in addition to presenting this rare typhus-like rash that Dr. Cantlie mentions, it is an excellent example of how numerous glands may be affected in succession, one set increasing as another set dies down, until in this case inguinal, parotids, submaxillary, sublingual and axillary were affected. There is recovery from an apparently hopeless condition supervening early in the case on the fifth day of attack, characterised by convulsions and collapse, and again there is the characteristic paralysis so frequently seen in plague convalescence. The previous occurrence in the family of glandular swelling with slight fever, or in other words, in all probability a mild unrecognised attack of plague, is also to be noted. I have to acknowledge my indebtedness to Dr. R. C. Paul, the practitioner in charge of the case, for the account of the first few days of illness, for the temperature chart, and for an admirably complete record of the drug treatment of the case—a record of some importance in relation to the causation of the eruption.

Case I.—K. F., female, aged 20, caste Benia. The patient was attacked with fever on the evening of October 27, 1899; simultaneously with the fever there appeared enlargement of the glands of the neck and groin, most marked in the groin.

Previous History.—The patient is the mother of

two children, aged respectively 3 years and 10 months. Her previous health had been good up to the day of the attack. There had been no case of plague in the immediate vicinity, but her step-daughter, who resides in the same house, had suffered from fever with swelling of one of the submaxillary glands about three months previously, but she recovered in a few days without much trouble. There had been no rat mortality in the house. The patient had not been out of the house for some days before she fell ill, nor had she had any visitors. There was no case of measles in the neighbourhood, nor any case of typhus, the latter disease in fact being unknown in Calcutta.

When first seen on October 28, the patient showed typical signs of plague. The temperature was 103.6° ; the pulse was full and regular (?); the tongue was slightly coated but moist; the conjunctivæ were slightly congested, and the patient had a stupid look and was delirious. The bowels had moved twice in the morning. The glands of the groin and neck, and the submaxillary, sublingual and parotid glands, were enlarged and tender. On the 29th the tongue was dry and coated, and the glands had increased in size. Tenderness over the liver was noted. By the 30th the swelling of the groin glands had already subsided, but the swelling of the neck was getting larger and more diffuse. On the 31st, i.e., on the fifth day of illness, collapse and convulsions supervened. The pulse became small and frequent, the extremities were cold, and the breathing was slow and prolonged. The conjunctivæ were congested, and the eyeballs turned up so that only the whites could be seen. There was frothing at the mouth and clonic spasms of the upper extremities. Thanks to mustard poultices, friction, warm applications and the like, the condition of collapse passed off, and in the evening it was noted that the neck swelling had diminished. Next day she became conscious for the first time, answered questions intelligently, and complained of pain and tenderness in the gum, and a burning sensation in the throat and stomach after taking medicine. By November 2 there was general improvement, but along with the tender gums there was now salivation. The eyelashes were noted to be fringed with mucus.

On this, the seventh day of illness, I saw her for the first time, and describe her condition as follows: Temperature 101.5° , pulse 140, but not markedly weak. Respiration is easy; the chest has not been examined. The tongue is clean at the tip with white streaks along the dorsum, but at the back it is brown and foul. The eyes are not congested. The speech is a little thick and slurred. The patient is quite conscious; the face is drawn and anxious.

Buboes.—There are large parotid buboes on both sides of the neck, most marked on the right, where the swelling extends right down the neck and involves the submaxillary gland. The swelling is soft, but no fluctuation can be made out in it, and its general appearance is in accordance with Dr. Paul's statement that it is decreasing. The glands of the left axilla are enlarged and tender. The patient is taking nourishment badly and nausea is present. On November 4, 1899, the pulse is not good, 140, weaker and slightly running; temperature is 103° ; the breathing is rather laboured, but there is no cough. The general

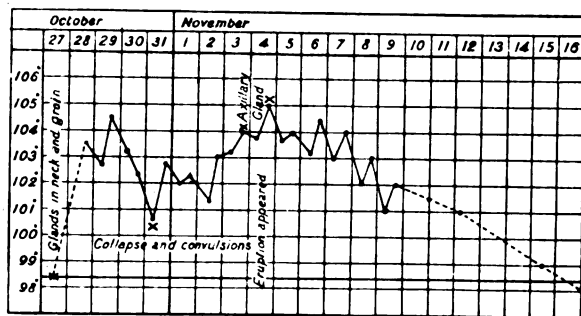
wasting of the patient is marked. This evening Dr. Paul noticed the eruption for the first time.

The Eruption.—It was on the evening of the ninth day of illness, then, that the eruption appeared as papules on the back and shoulders. Its appearance was preceded by nausea, developing into troublesome sickness during the night. Next morning the face was also affected, and it had begun to spread over the body till by evening the whole trunk was covered by it. Dr. Paul describes it thus: "Each individual papule was the size of a large pin's head, red, and raised above the surface of the cuticle with an abrupt margin; there was violent itching. Next day, on November 6, 1899, the papules were much more widespread and numerous, and tended to coalesce; itching was constant. Burning in the throat was complained of after taking medicine." On the 7th the notes run: "Each individual eruption is getting darker in colour and is extending in area; itching is present. Headache and nausea are complained of." That day I saw the eruption for the first time and found the following condition: The eruption covers head, face, neck, the whole of the trunk and limbs, in fact the whole body, unless for the palms of the hands and soles of the feet. It consists of purplish, dusky maculæ, raised for the most part into papules varying from $\frac{1}{8}$ in. to $\frac{1}{4}$ in. in diameter. These tend to be confluent, and in parts are sufficiently raised, particularly about the shoulders and back of the neck where the eruption first appeared, to give the skin a nodular, brawny appearance, added to in this region by the skin between the papules also being infiltrated. This last is most marked in the face, giving it a swollen look which, taken along with the puffy eyelids, slightly congested conjunctivæ and very slight conjunctival discharge, presents a picture extremely like that of measles. There is no discharge from the nose. The general condition shows little change, unless that the pulse is stronger and that the right parotid and submaxillary swelling is, if anything, increased in size.

On November 8, 1899, the general condition was rather improved, and as for the eruption, what had on the previous day been noted as maculæ on the right upper arm had now developed into papules. It had begun to subside on the face. The tongue,

eruption has for the most part faded, but dark purple maculæ still mark the arms, the last place on which it developed. The tongue is clean. The patient is asking for food, and the general condition is much improved. On November 15, 1899, she was found with temperature 99°, a pulse of 80, but very feeble. She seemed too weak to be shifted to another room for purposes of disinfection. She was wandering a little, and altogether her condition was not satisfactory. The rash, unless on arms and legs, has completely faded, and the glands are now altogether absorbed. This temporary relapse, due probably to slight heart failure—that failure that so frequently carries off a plague patient who seems completely convalescent—passed off, however, and on November 20, 1899, three weeks from date of attack, she was found out on the verandah practically recovered. There remains, however, a paretic condition of the lower limbs, so that the only method of progression is a shuffle in a sitting posture with the thighs flexed on the abdomen. Apparently the extensors of the thigh are affected, but examination was refused, so exact condition cannot be stated. The hands and feet show black hæmorrhagic spots on the site of the papules, much darker than they have been at any previous time. In ten days the paresis had passed off and she recovered completely. Dr. Paul notes that there was slight desquamation as the black maculæ passed off; personally I noted none.

Remarks.—Before definitely ascribing the causation of this extraordinary eruption to plague pure and simple, it is necessary to take into consideration the three possibilities of mistaken diagnosis, supervention on plague of typhus or measles, and whether the rash may not have been due to drug treatment. As regards diagnosis, it may be pointed out that unless for this rash appearing on the ninth day the case was as clearly and characteristically one of plague as one could wish to meet with. Both typhus and measles can be definitely eliminated for several reasons, not the least important of which is that typhus is unknown in Calcutta, and that measles, though a few sporadic cases were occurring in the city, was non-existent in the particular vicinity in which the woman lived. Moreover, even though it had been, the possibility of exposure to it must be set aside from the fact that the woman had neither been outside the house nor had received any visitors for some days previous to the onset of illness. Apart from the other features of the case, the date of appearance of the rash is also against the assumption that either of those two diseases can have been the cause of it. The extraordinarily close resemblance of the rash to that of typhus is very striking, however, for Moore's description of the latter in Allbutt's "System of Medicine" is almost absolutely applicable to the case. The order of appearance in the different parts of the body is slightly different, however, for in typhus the rash appears first about the armpits and the wrists, whereas the shoulders were first affected here and the wrists much later. In typhus "inflammatory swellings or buboes are not infrequent at or after crisis, especially in the parotid or submaxillary regions. To Murchison this fact suggested the kinship of typhus and Oriental plague or bubonic fever. He went so far as to say



as far as can be seen, for the swelling of the neck impedes the opening of the mouth, is clean.

On November 12, 1899, Major Drane, special health officer, saw her along with myself. Pulse was 104, strong, regular; temperature 101°. Swelling on both sides of the neck has almost disappeared. The

that typhus is probably the plague of modern times."⁵ The words "at or after crisis" are the crucial ones, for the buboes of plague are a very early symptom, if not actually initial, as in the present case. Murchison's contention may probably be correct as regards earlier pandemics of plague, particularly as eruptions, as already referred to, seemed to have played an important part, but as regards the present pandemic it is quite inapplicable, for, as I have shown, eruptions of any kind have been of the rarest occurrence.

The question of drugs is less easily disposed of than that of supervening disease or wrong diagnosis, for both belladonna and mercury were exhibited till physiological symptoms began to appear. In addition to the external application to the buboes of empl. belladonnæ liq., the tincture was administered for the first ten days in doses of η v. every three or four hours; burning of the throat was noted as early as the fourth day, while itching appeared along with the eruption on the ninth day. Nothing abnormal was noted in the pupils. The rash of belladonna is however a scarlatina-like rash, is of a fugitive character as opposed to the persistence shown in this case, and so far as I can find, is very unlikely to display itself as a morbilliform eruption eventually becoming purpuric. As regards mercury, I can only quote Professor McCall Anderson, who says that though cutaneous manifestations from the use of mercury have been described by some observers, he has never met with a case of the kind, and is of opinion that the so-called "eczema mercuriale" only occurs as the result of irritation due to local application of the drug.⁶ Dr. Stephen Mackenzie, quoted in the work referred to, includes it however as one of the causes of drug purpura. So, as no less than 36 grs. of hydrarg. subchlor. was prescribed in the course of the first eight days, mostly in doses of gr. ii., and slight salivation and tenderness of the gums were noted, it must be admitted that, possibly, mercury may have been the cause. But the possibility is not a probable one, so that on the whole, after a consideration of all the facts of the case, particularly that such an eruption has been noted in plague before, one must come to the conclusion that the eruption was a plague eruption.

Case II.—Jado, aged 50, female, caste Sonar Benia, 80H, Lower Chitpore Road. This patient was found on March 30, 1900, suffering from plague, fever and bubo having come on three days previously. Her condition is described by Dr. Sunyal as follows: Temperature, 103° F.; pulse 120, small, feeble, compressible; respiration easy, and there is no cough. There is a typical left axillary bubo. The patient is semi-conscious. I saw her three times during the next five days, during which she gradually improved. On April 5, 1900, it was noted that the bubo had almost absorbed, but a large raw surface was left over it, the result of excessive application of iodine. Her temperature was then 101° F., and her general condition, though much improved, still weak. On April 9, 1900, the fourteenth day of illness, a measles-like erythematous rash appeared, first of all about the shoulders. On April 10, 1900, I describe her condition as follows: There are large erythematous patches and splotches all over the trunk and limbs, face and head, back and front. On the back they are very large, 1 to 2

inches in diameter and irregularly circular in shape; in parts they are confluent. The smallest spots, $\frac{1}{2}$ inch in diameter, are found on the limbs where the eruption is least marked. Over the shoulders, on the other hand, the eruption is almost quite confluent. The eruption is very slightly raised and in colour is a light pinky red showing markedly against the skin, which in this woman is very light. There is no duskeness at all. There is slight itching about the spots. Previous to this the patient's temperature had been normal for two or three days and she had been apparently recovering, but the temperature is now 102° F., the pulse 110, feeble, and the general condition is very weak. On April 13, 1900, the eruption was noted to have almost faded, but reddish maculæ $\frac{1}{2}$ inch to $\frac{3}{4}$ inch in diameter were still to be seen on the legs, where it was last to appear. The back was then almost quite clear. The temperature was normal and the patient practically recovered.

Remarks.—Iodine may be eliminated in this case not only on account of the character of the eruption, but from the fact that the general symptoms of iodine were wholly absent, and that the limited external application had been stopped for some days before the appearance of the rash. The only other drug to be taken into consideration is digitalis, of which η vii. doses of the tincture were given every four hours for some days. But the digitalis rash is scarlatiniform, and moreover the use of the drug had been stopped before it appeared. The eruptions described present some points common to both cases, for in both it began on the shoulders and thence spread all over the body, the limbs being last affected. In both it was more or less morbilliform; and in both, though it seemed to be accompanied by a slight aggravation of symptoms limited in the first case mainly to rise of temperature but in the second case almost amounting to relapse, it failed to affect the ultimate progress of the cases to recovery.

Conclusions.—In the past, pandemics of plague eruptions seem to have been not uncommon, and at times seemed to form one of the diagnostic symptoms. It is possible that the explanation of this may be found in typhus fever, particularly as in the present pandemic general eruptions have been of the rarest possible occurrence. Amongst those that have been noted are typhus-like, morbilliform, erythematous, urticarial and sudaminous rashes. Partial local eruptions, though not so rare, have been uncommon—they include bullæ, pustules, petechiæ, and purpuric patches.

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THE

Journal of Tropical Medicine

JANUARY, 1901.

ANNOUNCEMENT.

THE JOURNAL OF TROPICAL MEDICINE will in future be issued twice monthly. The Editors find that they are justified in taking this important step in view of the increasing circulation of the JOURNAL, and also that they are compelled for reasons of space to increase the issue. Readers of the JOURNAL will have observed that current literature has not received sufficient attention lately; this has arisen not from want of material but from want of space. The original communications have grown so encouragingly that but little space is left for current literature. With the space now available this important omission will, it is hoped, be corrected, and the JOURNAL become a register of literature as well as a medium of publishing papers.

The Editors have received valuable suggestions

from time to time from contributors and subscribers, and as a Journal of the kind was essentially an experiment, they have availed themselves of the opinions of others. They are deeply indebted to Major O'Gorman, I.M.S., for many excellent hints and suggestions, and beg to convey their thanks to him and to others who have favoured them with their opinions and advice.

A NEW VOLUME COMMENCED.

An additional change is also found expedient. The JOURNAL was first issued in August, 1898, and consequently the yearly volume ran from August to July, a most awkward division. At the risk, therefore, of causing some confusion in binding, &c., the Editors think it advisable to commence the new volume with the year, and more especially as a new Century is being initiated. The annual subscription will for the future be 18/-, the price of each part 1/-.

A BROKEN-HEARTED SERVICE.

THE state of mind in which most of the medical officers of the Royal Army Medical Corps, who have served in South Africa, describe the feeling in the corps generally, is one of broken-heartedness. We can only view such a state of things as a national calamity and one which will have baneful effects in the immediate future. A service with its spirit gone, its aspirations thwarted, and its members dissatisfied, is not calculated to attract recruits to its ranks, nor to retain those who have joined it beyond the period of optional retirement. That there is something wrong somewhere, every one seems to be agreed upon; but where the cause of the dissatisfaction exists it is not so easy to determine. The one point, however, apparent to every one is, that the medical departments had an impossible task to perform; the magnitude of the work before them was out of all proportion to the strength of the corps; they were asked to accommodate and treat *hundreds* of sick and wounded where provisions were only made for *tens*; they were expected to bring their field hospitals to the front when transport was denied

them; to provide invalid food in a country barren of the ordinary necessities of life, even in times of peace. On the top of this, whilst yet the campaign was proceeding, whilst the medical department was trying to make bricks without straw, and sacrificing health and life heroically in the performance of duty, appears adverse criticism from irresponsible persons, criticism of such a kind that contradiction availed not, and took no heed of well-nigh unsurmountable difficulties. At home, again, the medical officers of the Army are being told constantly, by those who ought to know better, that they are of inferior professional mould, that they are recruited from any but the best class of young medical men, and that consequently they are not worthy representatives of the profession to which they belong.

Can it be wondered at, therefore, that the members of the Royal Army Medical Corps are depressed, that they see no prospect of betterment, and that they cannot take pride in the service to which they have devoted their lives? A soldier with his spirit gone, a corps that has lost its *verve*, is not a cheerful sight, nor a state of mind calculated to produce the best results.

We would, however, join issue upon several of the points that are being constantly mooted when the medical service of the Army is being discussed. We deny the statement that the medical men who enter the service of the Army consist of the least capable of our young men. There is a notion abroad that an Army doctor has a training and qualification apart from the medical man in civil life. It seems absurd to refer to so gross an error, were we not aware that the belief exists, and largely exists amongst the laity. A formal denial of so ignorant a conception is an easy matter, but we would go much further than that and state that the young medical man before he gains his commission in the Army is, as a rule, above the average in professional ability.

After his qualification is obtained he has to set to work to prepare himself for a further examination, and not only an examination, but until quite recently, a rather keenly competed-for appointment, in which the best men only were

chosen, and the "failures" sent back to civil life. After "passing in," a further most valuable and useful training is obtained at Netley, and by the time he "passes out" the young Army doctor is head and shoulders above the *confrères* he left behind him in civil life in almost every branch of his profession. We deny, therefore, the statement that he enters upon his duties in the Army as a professional inferior, when compared with medical men of his own age in civil life. Far other is the case; for by the training and by the examination superadded after his qualifications have been obtained, he is more highly educated in his profession than perhaps the best of his class-fellows who have rested on their laurels, and gone straight into practice after obtaining a qualification. Up to recent years, at any rate, almost every medical school in the kingdom prided itself upon the position its pupils took in the examinations for the Army, and published the results in the form of an advertisement as to the excellence of the training they afforded. Many of the medical men, therefore, over ten years' service in the Army, went in at a time when competition was keen, when the lazy and ignorant had no chance of getting in, and therefore did not come up for examination, and we hold it to be a mis-statement to say that the men joining the Army were professionally inferior to their civil brethren. After taking up duty in the Army the professional experience may be indifferent, there may be less stimulus to work, seeing that pay comes as a matter of routine; but our contention is that the medical profession gives, not its worst men to the Army, but men above the average, and, not infrequently, the best men of our schools went into the Army, attracted partly by the fact that the entrance was a competitive one. It is the fault of the military authorities, therefore, if they misuse the material supplied to them; we do not send our worst, at one time we even sent our best men, and the cause of the "broken-hearted" state the medical service in the Army finds itself, lies not with the inferiority of the supply from the medical schools, but with the system in vogue in the Army which permits so discreditable a state of affairs to have come about.

The aspiration of the junior officer is naturally to gain the higher ranks of his profession, but by attaining that rank what does he find? That he has to gradually drop his profession and become an administrative officer. He has to see to the administration of the hospital, not the treatment of the sick. His work is no longer at the hospital, but in an office, and his stethoscope and bistoury give place to a pen. After attaining administrative rank he grows more ignorant of clinical work daily, until, after say, ten or fifteen years in that capacity, the practice of his profession is a thing of the past. Theoretically, every medical man in the army is being trained to fit him for duty as the director-general of his department. Administration is the one great recommendation to advancement, and the correctness of reports are more highly prized than the lives he has saved. Even the more junior officers are harassed by clerical work. It is reports, reports, reports, that are wanted, rather than cures or good doctoring. All civil medical men who were with the army in South Africa testify to the wonderful administrative ability of even the more junior officers of the R.A.M.C. They speak in terms of unstinted praise of their capabilities in this direction, but all equally lament the fact that the time of medical men should be wasted in this manner. Much of the work they think could be done by quarter-masters. The medical officer is too valuable and too expensive a man to the nation to be so hampered and misused. If, on the other hand, the work can be done by no other than medical men, two branches of the service should be recognised, namely, a clinical and an administrative, and a captain about to be promoted to major should determine which he is to join. Should he join the clinical, and continue in it, the medical officer in the army will become the equal, in a professional sense, of the senior men in our great hospitals in civil life; or if administration is his bent, let him lay aside his profession and take up as at present the most necessary part of hospital administration. It must be remembered, however, that our hospitals in civil life are not administered by medical men, but by the laity; and it is difficult for the

civilians to grasp the fact that it is necessary for one in the position of a qualified medical man to do in the army what is excellently done by a committee and secretary in civil hospitals.

It is argued that the army officer is dealing with public funds, but so are the authorities in civil hospitals. The public subscribe voluntarily to support our civil hospitals, and not only so, but were the moneys they give not properly administered the supply would speedily cease. There is no difference, therefore, in responsibility, and the civil hospital accounts, stores, food, &c., have to be as carefully checked and dealt with as in a military hospital. One is done by persons without medical training, and why not the other? Allow the medical officers, therefore, more responsible clerical help, so that they may be enabled to continue to treat the sick and grow in medical knowledge with advancing years. In this way alone can the army service become a (medical) "professional" service, and one which will be self contained; one which will require no consulting surgeons attached to it from civil life to satisfy the public, but will be complete in clinical acquirements, as at present it is equipped with men of high administrative ability.

We confront the military authorities, therefore, with the facts, that it is not the quality of the men sent by the medical schools of the country that is at fault, but the system these men are submitted to, after joining the Army, whereby professional work is ignored and administrative ability is appreciated to the exclusion of clinical acumen and the treatment of the sick and wounded.

RHEUMATISM AND MALARIA.—R. P. Banerjee in his article "Rheumatism and Malaria," remarks that he has studied the two affections, and his observations have led him to the conclusion that there is a pathological connection between malaria and rheumatism. He is strengthened in this belief by the fact that the same medicaments are equally efficacious in the two diseases, be they used as remedies or preventives. The aetiological conditions are common to both rheumatism and malaria. Dr. Banerjee also mentions that malaria creates a special pathological condition of the blood, which acts as a predisposing cause for rheumatism.—*Ind. Med. Lancet*, October 16, 1900.

Translations.

MALARIA AND MOSQUITOES ON THE WEST COAST OF AFRICA.¹

By Dr. HANS ZIEMANN, Staff Surgeon, late Government Physician in Camaroon.

(Translated from the German by P. Falcke.)

REPORT II.

I OBTAINED the material, which must here be regarded as preliminary, in the first place in Camaroon, where I was Government Physician from the commencement of March, 1899, until April, 1900; then in Victoria, which is situated at the foot of the Camaroon Mountains, 4,000 metres high, during the two following months; and finally from June to July in the Colony of Togo. In Togo I was indebted to Dr. Bludan, the Government Physician, for affording me the opportunity of carrying on my investigations, he very kindly having placed his laboratory at my disposal.

In 1894-1896 I had already had the opportunity of conducting tropical-hygienic investigations on the west coast of Africa. Each of the three above mentioned fever regions represents, to a certain extent, a type of its own: Camaroon, low-lying and marshy soil, which is intersected by innumerable creeks filled with brackish water; Victoria, a mountainous coastal region with a basalt soil, traversed by a few swift mountain rivulets, and with a few marshes in the valleys through which the ground-water comes to the surface; finally Togo, in the locality of Little Popo, a narrow sandy coastal region, on one side washed by the sea, and on the other by a very long lagoon, into which many rivers flow, and in which consequently the masses of water have a certain movement. The situation of the ground water in all three localities averages from $1\frac{1}{2}$ m. to $1\frac{3}{4}$ m. below the surface. The dampness is relatively great. The differences between the maximum and minimum temperatures are but slight.

The rainy season in all three regions is from about April or May to the middle of October. The district of Victoria has the largest downfall, about 3,800 mm. In Debundja, which for abundance of rain stands only second on the globe, the downpours are even 10,000 mm.; in Camaroon the downfall is about 3,500 mm. The estimates for Togo have not been noted regularly, but are of less importance. The sea breeze in Togo is mostly very strong, blowing nearly the whole day. In Camaroon and Victoria it only comes on towards midday and is replaced at night by a very faint land breeze. The circumstance that three fever regions, so geologically dissimilar, could be studied together, may perhaps lend somewhat more general interest to the following observations.

The results gained at the one place by no means hold good for other fever regions also. The Brothers Plehn and Dr. Wicke have already reported the high morbidity and mortality, caused primarily by malaria,

in the regions mentioned. From June, 1898, to June, 1899, the mortality in the district of Camaroon was 9.8 per cent. per annum out of a total of 186 white inhabitants. This is a very high figure when the fact is taken into consideration, that in the majority, it related to strong men, and who, at least as far as the Germans were concerned, were in the military service. In the army in Germany, it is well known that the mortality per annum is exceedingly small.

The morbidity and mortality being, as is the case in most malarial regions, subject to great variations, it is highly necessary, in order to avoid erroneous conclusions, to embrace long periods and to make a large number of observations for the purposes of obtaining reliable results.

First of all I was able, in Camaroon, Victoria, and Togo, to confirm the fact that the type of primary tropical fever was generally the "tertiana maligna" in patients who had not been influenced by quinine, and who had previously never taken quinine. Short afebrile intervals alternated with rises of temperature for twenty-four hours, and upwards, during which the temperature oscillated from $1-1\frac{1}{2}^{\circ}$ C. R. Koch first of all called attention to the difference of the temperature charts of primary cases of fever as yet uninfluenced by quinine and of relapses.

Occasionally, however, there are found cases on the West Coast in which the first rise of temperature persists as long as forty-eight hours, and in very rare cases even lasts for seventy-two hours. In these cases, in the clinical sense, the type of fever may be the continued, irregular, or remittent. In such cases there are observed from the blood of the finger, often simultaneously, all forms of the tropical parasite, from the tiniest rings to the large crescents with initial pigmentation, which shortly afterwards complete their segmentation in the interior organs.

I think I am justified in regarding such cases as continuous, irregular or remittent, and in *contra-distinction to R. Koch, positively maintain their occurrence in the tropics*. The relapses mostly run their course as the double tertian or simple tertian types; the fever curves meanwhile, being much more pronounced than is the case with the maiden or initial attack of tropical fever.

I have never on the West Coast been able to confirm a *subsequent fever*, as described by Koch in East Africa, and which is supposed to be caused not by parasites, but by the absorption of the dead parasites. It certainly did happen that after the potency of the fever had been broken, in a number of cases a slight rise of temperature occurred; but in at least 50 per cent. of such cases the rise in temperature was explicable by parasites, though in exceedingly small numbers. It may be mentioned that (as A. Plehn with myself have already called attention to) in Camaroon, the number of malarial parasites extant in the peripheral blood often, nay in the majority, are in a remarkable disproportion to the severity of the clinical symptoms. I never, even in the severest cases, saw in Camaroon such numerous forms of the small parasites, as for instance are met with in the Maremmas of Tuscany.

In case of relapses occurring in Europe the Camaroon parasites might be much more numerous than in

¹ From a lecture delivered in the Pasteur Institute on August 6, 1900, at the International Medical Congress in Paris. For Report I. see December issue (1900) of this Journal.

Camaroon itself. This fact opens up the possibility that the small parasites of South Europe and the tropics often exhibit varying virulence according to the local conditions to which they owe their existence. Or can it be that the Camaroon parasites in Camaroon show a particular disposition to hide in the interior organs. The investigations conducted in this direction have yielded as yet no positive indications.

In contradiction to those persons who designate every case with a negative condition of the blood as non-malarial, it may be remarked that there are cases in Camaroon, though of rare occurrence, in which the clinical symptoms, such as regular intermittent fever, &c., undoubtedly speak for malaria, and in which the most careful and frequently repeated blood examinations only resulted in the finding of isolated parasites in the peripheral blood, and then only after the lapse of several days. Already in 1896 I directed attention to the extraordinary similarity between the tropical parasites and the æstivo-autumnal parasites of the Italians. In my book also, I expressly class the æstivo-autumnal forms of the Italians, and the parasites of the tropics in one group. R. Koch classed the æstivo-autumnal and the tropical forms of East Africa together as directly identical. Without by any means setting up the æstivo-autumnal and the tropical organisms as different kinds of parasites, it is worthy of note that the adult parasites of the "*tertiana maligna*" of the Italians occupy from one half to two-thirds of the red blood corpuscles and as such, are but occasionally seen in the peripheral blood till advancing to segmentation. The largest parasites of the Camaroon tropical fevers, in so far as they are to be seen in the peripheral blood, at most occupy from one-fifth to one-fourth of the infected red blood corpuscles. The segmentary forms likewise appeared to be on an average one-third smaller than those of the æstivo-autumnal. I have never in Camaroon seen such an agglomeration of pigment in the parasites of the tropical fevers as in those of the Maremmas of Tuscany; and this holds good in examinations of stained as well as of unstained preparations.

In opposition to A. Plehn and Laveran I would, however, steadfastly adhere to my opinion as to the difference in kind between the tropical parasite and the ordinary tertian parasite. It may be of practical significance to mention that lately several cases have been again observed of white persons, whose temperature hardly went up to 37.5° C., but in whom, nevertheless, the development of the parasites went on uniformly, without the slightest feeling of fever being perceptible. Of course, these isolated cases had as their subjects anæmic persons who had already suffered considerably from malaria. In still rarer cases, microscopically diagnosed as first attacks of fever, the temperature was not even 38.0° C. (See article in the *Centralblatt für Bakteriologie*, 1896, vol. xx., p. 670).

In negroes this condition seems to be of more frequent occurrence. The subjective disorders in these people are less pronounced than in the white race, and often there is no disorder at all. I have seen and described a corresponding condition in Italy, occasionally in quartan fever. Personally, with a parasitical infection of the æstivo-autumnal type in

Grosseto, I only had a temperature of 37.80° C., although at the commencement of the infection parasites were present in fairly large numbers.

There also occur cases in which malaria had been microscopically confirmed, and in which periodically there return again and again a considerable general feeling of indisposition, mostly accompanied by a sensation of depression. No satisfactory explanation for this has hitherto been given. Increase of temperature is scarcely or not at all observable, and no sign of parasites, notwithstanding careful examinations. Nevertheless, when quinine is taken these exceedingly distressing symptoms abate in degree. Bacteriology will never designate these cases as malaria, but the practitioner will give quinine, and with good results.

Perhaps the ætiology of these symptoms will become clearer to us when we are in possession of a satisfactory elucidation as to the nature of the relapses. I hitherto have taken it that a few malaria germs have remained latent in the interior of the organs after recovery from malaria, and when a predisposing cause arose they again germinated, thus causing the relapses. Part of the relapses will, no doubt, eventually be explained as above, when the first attack of fever has not been rationally and energetically combated with quinine, but as yet it seems questionable if this applies to all relapses.

In the case of two negro children who were suffering with splenic tumour, who had had frequent relapses but had never taken quinine, I performed puncture of the spleen a week after the last attack had passed over. With the exception of a few isolated crescents I found no trace of active malarial parasites, in spite of the most careful examination of nearly 100 preparations.

A. Plehn conjectures that certain granules in red blood corpuscles, which absorb basophil, occasion the relapses by transformation into active malarial parasites. These granules correspond with granules similarly stainable which I discovered three years ago in the red blood cells of cattle ill with Texas fever. These granules I had regarded hitherto as appearances of degeneration.

It may be propounded, whether the crescents, &c., in short, the sexual forms, which, as is well known, remain in the spleen and bone-marrow long after an attack of malaria, are not to be brought into relation with relapses; in this connection my investigations are not yet concluded. We also know nothing whatever of the changes which take place to transform the malarial sporozoites, injected by mosquito bites, into ordinary malarial parasites. The conclusions of MacCallum, Koch, Grassi, Bignami, and Bastianelli as to the relation of the sexual parasitical forms in blood preparations have been confirmed anew and the presence of chromatin in the microgamete of the flagellating body was called attention to in 1897.

Clinical Features. — Notwithstanding the exceedingly severe nature of the illnesses, the tropical fever of Camaroon gives, on the whole, a favourable prognosis, provided of course that the therapeutics are rational. I only lost two patients with simple malaria, one who had been under other treatment, and whom I only saw just before death; the second

was found on his bed one morning unconscious, and shaken with tonic and clonic convulsions; he was foaming at the mouth, and he had an ever-increasing fever rising to 42° C. Blood from the finger gave negative results. He died after ten hours. Autopsy revealed severe cramping of the cerebral capillaries with malarial parasites.

During my last period of service on the West Coast, with the exception of the parasites of tropical fever, I never saw quartan parasites in white people, only tertian parasites, and these only in Camaroon, and even there only on three occasions, and of these one case came from the rocky island of Fernando-Po.

Koch, in East Africa, found the tertian parasite in 10 per cent. of all cases of fever; in Camaroon I found the same only in 1.1 per cent. of the cases. This difference is exceedingly remarkable, and signifies in other words: In Camaroon the clinical feature of malaria is dominated almost exclusively by the tropical parasite. In negroes in Camaroon and Victoria I also found only the parasite of tropical fever.

The investigations as to the frequency of malarial infection in negroes yielded interesting data which I will touch on later. The resistance of negroes in this respect is well known. Six years ago (see my book, p. 46) I had observed the frequency of splenic tumours in little negro children in Camaroon. I examined a great number of natives in Victoria and Togo, as well as in Camaroon, and in the latter place I specially examined various coastal races, and, for purposes of comparison, races from the interior which lies higher. *Contrary to the East African mountain folk mentioned by Dr. Koch, none of the West African people I examined ascribed malaria to mosquitoes.*

I think I may be assured of your agreement with me when I mention the probability that the presence of splenic tumour in 99 per cent. of the cases may be taken as a sign of malaria, past or present. In Togo in particular, a large number of blood examinations were made, and in Togo alone 250 negroes were submitted to this test.

When I found only crescents or a number of melaniferous leucocytes, of course I took it for granted that malaria had been present.

Those who have learned to know the intelligent natives of other tropical regions can hardly picture the difficulties to be overcome in dealing with the uncommonly superstitious negroes of Camaroon, and especially of Togo. The results attained were that:—

(1) The mulattoes in Camaroon all showed the traces of malaria infection.

(2) The negro children in Camaroon, Victoria and Togo from birth to the 15th year are particularly susceptible.

(3) The susceptibility diminishes as the age advances, without, however, disappearing entirely.

The children of the Dualla, the inhabitants of the estuary of Camaroon, show the infection or the traces of infection:—

Up to 5 years in 37.1 per cent. of cases.

From 5 to 10 years in 18.8 per cent. of cases.

From 10 to 16 years in 21.8 per cent. of cases.

The two last figures almost coincide. Out of a total of 170 Dualla examined (adults and children), 23 per cent. bore the traces of malarial infection.

After the surrender, and before they emigrated to their present district, the Dualla had already dwelt in the marshy valleys on the Lungasi, so were already acclimatised. The percentage of the people of the Ngumba and Jaunde, who originally lived far in the interior on the western declivity of the inner African plateau, at a height of from 600 to 1,000 m., was 12 to 23 per cent., provided that they were examined as soon as possible after their arrival from their home. According to verbal communications, Jaundes, who never come to the coast, also suffer from malaria in their own home. Minute investigations and experiments by the military doctors on the spot are urgently needed.

A remarkably high percentage, up to 75 per cent., was found in captive women of the anthropophage race of the Bulis, from the districts of the great primeval forest which extends from the coast to the border of the plateau of Central Africa; the percentage in children was up to 100 per cent. As all these persons had only been on the coast from two to four weeks, and a splenic tumour, as is known, only comes to pass after several attacks of malaria, it is possible that a portion of these negroes had already acquired the infection in their native land. In any case, in comparison with the coastal inhabitants, these people showed an extraordinary susceptibility for malaria; whereas the Dualla, living in Camaroon, with its evil reputation as regards malaria, had certainly become infected to the number of 23 per cent.; 159 Eweites in Togo, whose blood was minutely examined, exhibited to the number of 47.2 per cent. active parasites, or even crescents, or melaniferous leucocytes. In 32 of the 159 persons of the Ewes tribe I found the tropical parasite, in one the tertian, and in seven the quartan parasite. Mixed infections of quartan and tropical fever also occurred. Persons of the Ewes tribe, aged 30 years and upwards, with malaria microscopically confirmed, who frequently felt ill, and suffered with relapses, were often seen. Nothing could be ascertained as to the former dwelling place of the Eweites and the period of their immigration to their present district.

Splenic tumours were found in 33 per cent. of 193 Ewes negroes examined in Togo. Thus the results gained, on one side by palpation of the spleen, and on the other by blood examination, do not quite coincide.

The commercial people of the Haussa, who came originally from the steppe-like interior of West Soudan, also exhibited infection, but more frequently in children than adults.

At any rate, I cannot for West Africa accept the view that natives in their youth attain full immunity. It seems more rational in such cases, upon the whole, not to speak of immunity, but of increased power of resistance against malarial infection. Even the Bakweris living between unhealthy swamps in Victoria only gained a relative resistance after their tenth year. The natives of the Maremmas, the Campagna, &c., would on this supposition also be immunised. It has long been a well-known fact on the west coast of Africa that white people also, who at the commencement of their stay frequently had fever, at last attained a sort of relative resistance.

I know a gentleman who, formerly, recovered from innumerable attacks of fever, and had hæmoglobinuric fever thirteen times, who at the present only gets slight attacks every three or four months. In Togo the merchants even prefer to keep clerks who had weathered their first year of stay there. On the other hand it is possible that people who have been on the West Coast in fever regions for twenty-three years in good health (that is to say, who have had but few fevers) may yet succumb to simple tropical fever.

Most of the fever cases in negroes recover spontaneously. A number of the children, however, die of severe cachexia. With whites also, as has been long known, there is not rarely spontaneous recovery from relapses. Nevertheless, the danger of relapses is great where there has been treatment without quinine. Spontaneous recoveries from the first attack of fever in whites do occur, but very rarely, at least within the first eight days from the outbreak of the fever. In regard to seven inoculatory experiments which were undertaken on willing adult negroes with malarial blood containing the tropical parasites, the result was that in 3 cases the fever broke out after twelve days, in 1 case after ten days, in 1 case after eleven days; in 3 cases the experiment was negative. *The circumstance that the inoculation was successful in 71.42 per cent. of the cases certainly by no means bears out the idea of complete immunity, attained earlier in life, of the negroes so inoculated.* Of course these experiments, carried out in a malarial district such as Camaroon, are not of absolute value, although every effort was made to exclude the possibility of a natural infection. At all events the duration of the period of incubation of ten to eleven or twelve days tallies with the time of incubation which, with the Plehn Brothers, I fixed for Camaroon as between eight and fourteen days. It may be a fresh fact that the most pronounced leucocytosis happens to be found in negroes ill with malaria, and in the leucocytes so large a number of grains of pigment as has never been seen in patients of the white race. This doubtless has some connection with the mechanism of spontaneous recovery.

Places free from malaria have hitherto not been found, nor any in which, as Laveran thinks, malaria was extant before the immigration of man. The proof of the existence of such places can hardly be confirmed, and would be of the greatest importance for tropical hygiene. Even on the Island of Mondoleh, near Victoria, which hitherto has been looked upon as healthy, I could confirm the infection in 35 per cent. of the negro children, which could only have been acquired on the island itself, as the children had never left it.

(To be concluded January 15, 1901.)

PLAGUE.—South America seems to be the chief source of danger to the towns on the Atlantic seaboard. Cases from the River Plate have reached New York, Cardiff and Hambury during the past year, and quite recently a vessel from the same locality arrived at South Shields with plague on board.

British Medical Association.

TROPICAL LIVER ABSCESS.

THE MANAGEMENT OF LUNG LESIONS CONSEQUENT ON LIVER ABSCESS.

By Colonel KENNETH MACLEOD, LL.D., M.D.

Professor of Clinical and Military Medicine, Army Medical School, Netley.

(Continued from p. 125.)

The question arises, what should be done in these persistent, recurrent or aggravated cases? The reply given in the text book is—establish a direct external drain by incision and insertion of a tube after localising the abscess cavity by aspiratory exploration. The instruction is to search the cavity in the liver and to make the incision and insert the drainage tube through the liver substance. The indication appears to me to be sound, but the method of fulfilling it faulty, and the object of this paper is to urge that the case should be treated as one of lung cavity, and the exploration and incision made into the chest. I formed this opinion upon two grounds, namely, first, that while the pulmonary symptoms are undergoing aggravation, and the lung progressive destruction and excavation, the abscess of the liver is undergoing reparative changes—becoming encysted and contracted and shut off from the rest of the organ by a cicatricial capsule; and second, that I have frequently seen exploration of the liver resorted to in such cases and invariably without success. I have had an opportunity of examining several cases of fatal pulmonary lesion consecutive to and consequent on liver abscess, and have observed the conditions which I have mentioned, namely, active and aggravated lung destruction associated with hepatic abscess exhibiting signs of separation. In these cases the abscess cavity in the liver had become globular, contracted, and encysted, a well-defined capsule or cyst wall of cicatricial tissue enclosing it, surrounded by apparently healthy liver substance. I have detailed two such cases at length in a paper published as an appendix to the Army Medical Department Report for the year 1897. In one of these cases the cavity of the liver abscess still communicated with the secondary lung cavity and contained grumous pus; in the other the communication between the two cavities had been closed, and the liver cavity was completely encysted and its contents consisted of caseated pus. The condition in this case resembled what happens sometimes, though very rarely, as a spontaneous method of cure in liver abscess, encysting of the cavity and caseation and finally calcification of its contents. This encapsulation of the liver abscess explains why in these cases it is vain to expect to find in the expectorated material evidences, such as amœbæ, hepatic cells or bile reaction, indicating its hepatic origin, and why microscopic examination of the sputum gives proof of active lung destruction. The stuff coughed up may, indeed, continue to resemble what is chemically recognised as hepatic pus; but I have known material expectorated from lung cavities resulting from empyema pronounced to be "hepatic pus" when there was no lesion of the liver at all. Too much reliance must not therefore be placed, in diagnosis, on the mere physical characters of the sputum. The contraction of the abscess cavity, in conjunction with its original position, explains why exploration of and through the liver fails in these cases to reach or discover it.

In one of the cases to which I have referred no fewer than seven explorations were made without success, and I have repeatedly seen similar failures occur in other cases. Indeed, I cannot recall any instance in which success attended an attempt to reach the abscess cavity through the liver when it was evident from the history and symptoms that profuse and sustained expectoration of a muco-purulent, or sanious character resulted from a liver abscess bursting

into the lung, and having evacuated through the air passages. On the other hand, in such cases, physical signs of a cavity in the lung will generally be found, and exploration by an aspirator through the chest wall will give positive proof of its existence. This is exemplified by one of these cases, and great relief of symptoms resulted from making a free opening and inserting a large drainage tube. This is the practice which I advocate in cases of this description, in place of vain efforts to broach the abscess cavity through the liver. It has the additional advantage of being the correct and only possible means of surgical relief in cases of encysted empyema eroding and discharging through the lung. When this condition has been established in the right chest it is often difficult, especially in persons who have lived in India and had liver trouble, to exclude the possibility of origin from liver abscess.

My contention is, to sum up the matter in a few words, that in old standing cases of lung lesion consequent on hepatic abscess, the pathological burden has been transferred from the abdomen to the chest; and that relief measures must be applied on that understanding, the lung lesion being treated according to the special indications of the case, and the liver left to take care of itself.

SUBHEPATIC ABSCESS.

By JAMES CANTLIE, F.R.C.S.

Surgeon, Seamen's Hospital Society.

By a subhepatic abscess is meant a collection of pus on the under-surface of the liver, between the liver and its capsule, commencing most probably in the lymphatics of this region. The terms I employ in the differentiation of abscess of the liver are three in number: (1) Intrahepatic abscesses mostly of dysenteric origin; (2) Suprahepatic abscesses situated between the layers of the broad ligament of the liver, commencing as a lymphangitis; (3) Sub (or infra) hepatic abscesses, in which the pus lies between the liver substance and the capsule, commencing probably as a lymphangitis. The second and third are independent of intestinal lesions, their pus is "sterile," and *Amœbe coli* do not appear in them until some days after the abscess is opened. In one case of suprahepatic abscess empty sheaths of *Filaria nocturna* were found; it is possible the lymphangitis may in some instances be due to the results of filarial infection.

I am not prepared to state the cause of, nor to assert why, the pus should select this region. The few cases I am conversant with occurred either in persons who resided in the tropics, or in persons who had visited the tropics at some time shortly before being attacked. It is, so far as I know, not dependent upon dysentery or any ulcerative state of the intestines. It may be malarial in origin, but I have no reason to assert that it is.

Any derangement of the liver may be a possible cause. The lymphatic glands at the gate of the liver become affected by material absorbed into them from the liver above and the neighbouring viscera below. Even the melanin deposited in the liver during malarial hepatic infiltration collects in these glands, and thereby hinders their action and chokes their interstices. In such a state it requires but a slight derangement to set up irritation, inflammation, and subsequent suppuration, either in the glands or the lymphatics leading towards them. In subhepatic abscess we have a counterpart of suprahepatic abscess.

At the last meeting of this Association I brought forward clinical evidence of suprahepatic abscess, and I then advanced the theory, and I see no reason for departing from it, at a year's further experience, that it was caused by an inflammation of the lymphatics received from the upper surface of the liver between the layers of the coronary ligament. I ascribe similar pathological changes as the cause for subhepatic

abscess—namely, inflammation of the lymphatics, and possibly the lymphatic glands on the under surface of the liver.

The only single definite feature which can serve as a guide to subhepatic abscess is the presence of a tumour in the epigastrium (along the costal margin) which is found to contain pus, and has for its boundaries the liver above and an inflammatory thickening of the perihepatic tissues around. As this condition can only be exactly elucidated during an operation, clinical evidence can at best do little more than suggest the possibility of such a condition.

In the two or three cases of which I have definite knowledge, the situation of pus was as indicated above. Previous to operation the local signs and symptoms were:—

(1) A tumour projecting from the anterior margin of the liver to the left of the fundus of the gall bladder and behind the right rectus muscle. The tumour formed a distinct prominence below the edge of the liver and felt like a full gall-bladder, although situated to the right of the position where the gall bladder is usually found.

(2) Perihepatitis with friction sounds showing an increased area from day to day. As the area extends, friction sounds disappear from the centre of the dull area, but continue to spread at the margin, showing the formation of central adhesions and a widening in the perihepatic inflammatory area.

(3) Hepatitis not marked, nor is the area of the liver dullness much, if at all, increased.

(4) The general symptoms are: Increase of temperature by three or four degrees, occasional rigors, generally paresis of the intestine, or, on the other hand, loose bile-stained stools, disturbance of the circulation and of the thoracic movements commonly met with in inflammatory changes in the neighbourhood of the liver.

The positive evidence, however, can only be established during an operation. After an incision into the abscess and the escape of pus, by passing a probe or the finger into the wound the liver can readily be made out above, and also the complete absence of any resistance below which could suggest liver being there. In case this evidence is not considered satisfactory, I have, however, more convincing proof of the situation of the pus being what I have described. Whilst discussing this matter with Sir Lauder Brunton, not only did he say he was convinced of the possibility of a subhepatic abscess, but had actually seen one in his own practice where, during a laparotomy made for diagnostic purposes, a large subhepatic mass of pus was found to extend along the under surface of the liver from the anterior to the posterior border. The pus lay between the peritoneum and the liver substance, and had only peritoneal and inflammatory thickening around it except above.

The diagnosis of subhepatic abscess is not unattended with difficulty. Gall-bladder inflammation is most likely to be mistaken for the abscess, seeing that the relation of both to the anterior abdominal wall is almost identical, and that the hepatic symptoms in both are pretty similar. The diagnosis must rest for the most part on the history of the case, but when this is unobtainable the surgeon must be prepared when about to operate to deal with either condition. The pus from the abscess possesses but little resemblance to liver pus; it resembles rather ordinary creamy pus from an abscess elsewhere in the body.

Prognosis.—Of the few cases I have seen, the prognosis is good, no death having occurred. One man, the captain of a ship sailing between Hong Kong and New York, left nine days after the abscess was opened with a drainage tube in the cavity of the abscess. In the case mentioned by Sir Lauder Brunton the pus was so extensive that an opening was made behind as well as front to ensure proper drainage. This has not been necessary in the cases within my personal experience.

Treatment.—The treatment of this form of abscess presents nothing peculiar. Tapping by a large trocar and drainage by a large tube has proved satisfactory in my hands; but incision when adhesions are known to have formed is free from danger, and in the one case in which I have seen it practised it proved eminently satisfactory.

THE DEPTH TO WHICH IT IS SAFE TO PUNCTURE THE LIVER.

Mr. Cantlie demonstrated the position of the inferior vena cava in reference to its distance from the surface of the body. He stated that by a study of frozen sections it is possible to ascertain how deep the needle of the aspirator or the trocar and canula can be carried into the liver without causing untoward consequences from hæmorrhage. He finds in a body with a circumference over the hepatic area of 32 inches that the centre of the inferior vena cava is from $4\frac{1}{4}$ to 5 inches off the surface, in a line drawn horizontally from the neighbourhood of the xipho-sternal articulation to the angles of the ribs behind. Before commencing an exploratory puncture of the liver, therefore, Mr. Cantlie recommends that the circumference of the body be taken, and starting with the above measurement as a basis, a fairly accurate idea of how deep the puncture may be carried is ascertainable. In a body measuring 32 inches in circumference, it is not safe to penetrate deeper than $3\frac{3}{4}$ inches in a horizontal direction from anywhere in the line mentioned. For every inch of circumferential measurement above or below the 32 inches, $\frac{1}{4}$ inch may be added to or subtracted from the depth it is safe to penetrate. Abstraction of blood in inflammatory hepatic derangements Mr. Cantlie regards as most salutary. When the needle enters a large vessel in the liver substance, as judged by the free flow of blood in the bottle, he allows the needle to remain until 6 to 10 ozs. of blood are withdrawn. No ill effects follow tapping a vein in this position: it is only when the inferior vena cava, or the trunk of the portal vein before it breaks up in the liver, are wounded that dangerous hæmorrhage is likely to follow. Every puncture of the liver by a needle causes a slight or even considerable flow of blood subsequently into the peritoneal cavity, as he had been able to prove clinically; but in all probability it was this very flow of blood which contributed to the marked benefits usually following liver puncture. The dangers of hepatic hæmorrhage are confined to puncturing the inferior vena cava, the extra-hepatic portion of the portal vein, or penetrating a mass of malignant tissue occupying the liver.

THE DIAGNOSIS AND SURGICAL TREATMENT OF TROPICAL LIVER ABSCESS.

By WM. JOHNSON SMITH, F.R.C.S.

Surgeon Seamen's Hospital, Greenwich.

It can hardly be questioned that during the last quarter of a century the prognosis of certain morbid conditions of the liver has been much improved, and with regard especially to the so-called tropical abscess of this organ, operative treatment by the increased efficiency of its results may be regarded as a satisfactory example amongst many of the recent developments and advances of abdominal surgery. Moreover, there can be no doubt that of late years not only has the surgical treatment of hepatic abscess improved, but that also, in consequence of a better appreciation and a more active application of surgical methods of diagnosis, the proportion of such cases brought under the surgeon's care whilst still in favourable conditions for operative treatment has considerably increased. Waring's well-known analytical work, published in 1854, is a pathological rather than a clinical record of most of the 300 cases with which this author dealt. In only eighty-one of these cases had any operation been performed, and in these cases, notwithstanding in a large proportion the very elementary and simple nature of such treatment, the mortality was not less than 81 per cent. Such results as these would certainly justify the very unfavourable judgment of Lafleur on surgical intervention summed up in the sentence that in amœbic abscess of the liver there is slender hope of recovery after operation; but surely so recent and able an authority on this subject might be induced to reconsider this statement by the much more favourable records of later statistics. As a fair example of these, I might allude to a recent com-

munication on the treatment of hepatic abscess by Malbot, a French surgeon, who has had much experience of this disease in Algeria. This author, at the end of last year, published 19 cases under his own observation, 8 of which were treated by transpleural incision and 11 by laparotomy, with a total mortality after both methods of 33 per cent. In a report I drew up about five years ago of the cases of hepatic abscess treated in the Seamen's Hospital from 1870 to 1895, I found clear indications of the increasing tendency during late years to submit such cases to surgical attention, and whilst during the first twenty years of this quarter of a century 8 cases only out of 37 were treated by an operation which in most instances consisted in a simple incision of a prominent swelling on the right hypochondrium, in the course of the last five years 9 out of 13 were surgically treated, 8 by transpleural incision with resection of a portion of a rib, the remaining single case by laparotomy. There is no necessity, I believe, at the present day, to anticipate any serious questioning of the absolute necessity of bringing under surgical notice any case of supposed tropical or amœbic abscess of the liver. The spontaneous cure of such a condition, even though the collection be a very small one, is very problematical; and though perhaps for the subject of such disease spontaneous rupture through the lung may be the happiest event, one must not forget that while waiting for such not improbable result, the abscess may extend in a much less favourable direction. The need for surgical aid in cases of supposed liver abscess is necessary, not only for strictly therapeutical purposes, but also in a large proportion of cases for the sake of obtaining a certain and precise diagnosis. Except in those cases forming, I believe, a small minority, in which the abscess forms a well-marked tumour in the right hypochondrium, the determination in the first place of hepatic suppuration, and in the second place, if this be assured, of the localisation of the disease and also of the existence of one or a plurality of collections, is almost always attended with more or less difficulty. There can be no doubt that most subjects of hepatic abscess present a collection of very suggestive symptoms, but such symptoms, usually not more than suggestive, are to be regarded as signs of probability and not of precision.

The physician, and especially one who has had a large experience of such cases abroad, cannot as a rule say more after a review of strictly clinical symptoms than that the patient ought to have an abscess of the liver; but still, on the strength of such an opinion, however authoritative it may be, one would naturally hesitate before exposing the patient to an operation involving exposure of pleural or abdominal cavity, or both these cavities together. This uncertainty in the clinical diagnosis of hepatic abscess is mainly due to two causes: in the first place, most of the symptoms given in the textbooks as indicative of this affection are met with in other morbid conditions of the liver, and, in the second place, they are often associated with and marked by those of dysentery and malaria. The temperature is not a good guide, as it is often very irregular, and in severe and advanced forms of the disease is low and even subnormal. Shoulder-tip pain, though more frequently present than seems to be generally supposed in cases of liver abscess, may be absent, and moreover, when present cannot be relied upon. Rigidity of the rectus may be due to disease of intestine or some other abdominal organ, or even of the muscle itself. Of all the suggestive signs of the disease localised tenderness over some part of the surface of the liver is perhaps the least unsatisfactory. The results of chemical examination of the urine do not seem to have given any reliable results, even in cases in which a considerable amount of liver structure has been destroyed.

Fresh aids to diagnosis have been brought under notice from time to time, but hitherto these have failed to afford much help. Attention has of late been directed to the occurrence in cases of liver abscess, especially when involving the posterior and upper part of the right lobe and encroaching on the diaphragm, of what is called functional

dyspnoea, by which term is implied exaggerated movement of the thoracic wall without any other indications of intrathoracic mischief. Such a condition, however, even though of frequent occurrence in association with liver abscess, which, I am inclined to think, is far from being the case, may be due to direct irritation of the diaphragm or any painful affection in or about the liver, and thus will fall into the list of indications that are more or less uncertain. Then, again, help has been invoked from a rather unexpected quarter, and an attempt made to extend in this direction the utility of the Roentgen rays. Loison, in a recent paper on the treatment of hepatic abscess, states that in several cases of this affection he has gained much assistance from skiagraphy. If, this surgeon states, a healthy subject be placed before the fluorescent screen, the shadow presented by the diaphragm will be seen undergoing rhythmical movements of rise and fall under the influence of respiration. This shadow, it is asserted, shows a difference of level on the two sides, the most elevated part of the vault of the diaphragm being about $1\frac{1}{4}$ inch higher on the right than on the left side. In cases of hepatic enlargement this difference is still further increased and the right half of the diaphragm no longer moves. In effusion into the right pleural cavity, on the other hand, the convex shadow of the corresponding half of the diaphragm is no longer visible, and all that can be discerned is a horizontal line indicating the level of the effusion. This diagnostic method surely requires the aid of an expert, and cannot, it seems to me, do more under the most favourable conditions than assist the not very difficult diagnosis between pleural effusion and an enlarged liver.

The strictly clinical signs of liver abscess as given in textbooks vary considerably in diagnostic importance. Whilst some can give very little, if any, certain help, others, especially when present in full force, might fairly justify the conviction that there ought to be an abscess somewhere in the liver. The key-note, of course, to our diagnostic scale is previous residence in a hot country, and a previous history of dysentery or chronic diarrhoea is of much importance. From my own experience, which, though extended over a long period of time, is relatively very small, I have been led to look upon an association of most or all of the following clinical data and signs as urgent indications for prompt investigation by surgical means of the condition of the liver. The patient, whom we will assume is between 25 and 45 years of age, has resided in a hot country, and has suffered whilst there from dysentery. There is tenderness over the liver varying in extent from time to time, but always most marked at one spot. There is decided and troublesome shoulder-tip pain, and well-marked signs of gastric irritation. The patient is emaciated, presents a peculiar sallowness, though not jaundiced hue, and is depressed in spirits and mentally torpid. The temperature is irregular, though showing more or less tendency to the remittent type. There is, I believe, in cases of liver abscess a decidedly characteristic position, the patient lying on his back with the chest raised and the lower limbs slightly flexed. Of course we must expect to find a more or less extended area of hepatic dullness, but, except with large abscess, this may not be readily appreciable. The difficulties in diagnosis by medical methods of observation, as might be anticipated, vary in accordance with the abscess. If, together with other clinical indications, the patient presents in the right hypochondrium a fluctuating swelling over the most prominent part of which the skin is oedematous and congested, nothing can be more simple, but, unfortunately, such cases are in a minority. The most difficult of all are the very rare instances in which a small single abscess is situated in the left lobe of the liver. There are two further methods of diagnosis by which alone, in most cases of liver abscess, the uncertain can be made certain, and the indications hitherto regarded as uncertain and merely suggestive can be surely confirmed. The surgeon, when called upon to assist in justifying any further steps for operative and radical treatment, has to decide between exploratory puncture and exploratory laparotomy. For my

own part, I prefer the former, as I have almost always seen it applied with success in cases of abscess, and have never witnessed any bad results from its use. Objections have, however, been made to the needle and the syringe from time to time, and there seems now to be a tendency in some quarters to resort at once and exclusively to exploratory abdominal section. The latter procedure, there can be no doubt, if performed with proper precautions and with proper care, is a safe operation, and surely the same may be said of the much less alarming and troublesome procedure of exploratory puncture. Laparotomy under the most favourable conditions has certain inconveniences and after-troubles; I am speaking of it now simply as an aid to diagnosis and as an alleviative measure which ought to be taken into consideration. It necessitates the administration of an anæsthetic, causes much anxiety to patient and to patient's friends, and may result sooner or later in a tendency to ventral hernia. I much question whether laparotomy can in the majority of cases afford us more help than simple puncture. The liver, from our present point of view, is to be regarded rather as a thoracic than as an abdominal organ. The posterior part and upper part of the right lobe may be felt but cannot be seen, and the route to the seat of the supposed abscess may be barred by adhesions which it would be imprudent, if not dangerous, to break down. Even if this exploratory procedure reveal to us the situation of the abscess, it will usually fail to give any further assistance, as in the subsequent plan of treatment it will be found necessary to attack the seat of the disease by the same methods and the same direction as when the presence of pus has been revealed by a simple puncture. Moreover, and this I take to be a strong, though it may be a sentimental objection to laparotomy as an exploratory measure, there is the probability that the exposed and handled liver may be found to be quite healthy.

I must confess that I see no good grounds for opening the abdomen simply as an exploratory measure, unless, notwithstanding the presence of high fever and localised pain, and other very suggestive symptoms of abscess, the repeated use of the needle and syringe has failed to reveal the presence of purulent fluid. It would be difficult, I think, without laparotomy to find out a small abscess in the left lobe, and it is in a condition of this kind only, which occurs only in about one case in fifty, that I have myself opened the abdomen and seen it done by one of my colleagues. Exploratory puncture by needle and aspirating syringe is, I believe, an almost perfectly safe procedure, provided that in this as in other operations, whether minor or major, we use a suitable instrument that is in proper working order and thoroughly sterilised. I have generally seen used a syringe capable of taking from 60 to 120 minims of fluid, and a hollow needle from 3 to 6 inches in length. I see no advantage in using any of the larger aspirators, such as Dieulafoy's or Potain's, as they are more complicated than the simple needle and syringe, and are liable to break down at the most critical point of our exploration. Simple puncture with aspiration is, I feel sure, not only a safe but a very efficient aid to diagnosis. If the needle be introduced at a bulging spot over any part in front of the liver, or at some point of extreme tenderness, or into a widened and oedematous intercostal space, it will seldom fail to reveal the presence of pus; and if a series of from one to half-a-dozen punctures made within the area of hepatic dullness from the front to the back of the chest give no result, there will be a strong probability that the right lobe of the liver at least is not the seat of any purulent cavity. In case of failure, should the symptoms of liver abscess with high fever, sweating, and exhaustion still persist, we may after an interval of a few days again try the needle and syringe, and if these still fail, resort at last to an exploratory laparotomy. If, as is usually the result after two or three punctures, the characteristic fluid of a liver abscess be drawn up into the syringe, an operation for giving free discharge to such fluid and exposing and draining the interior of the cavity should be practised immediately. If the patient be anæsthetised

during the puncturing process, it would be very advisable to complete the operative treatment at what the French call the same sitting. This I believe to be a point of much practical importance with regard to the safety of the method of exploratory puncture. The soft parts between a liver abscess and the surface of the body may be œdematous and congested, or in consequence of some leakage of pus, either antecedent to or actually caused by the introduction of the needle, may be sodden by the discharge, and in consequence of either of these conditions may, if not relieved by free incision, become the starting point of serious septic mischief. Moreover, if we have struck an abscess in the liver, it would be well to take full advantage of the information thus obtained, and to follow at once the track of the needle. I have known instances in which a second puncture made at the same spot after an intermission of some hours has, in consequence probably of some difference in the position of the patient, failed to give the same result—a cause of some embarrassment to the surgeon, who in operating for liver abscess ought, I think, to make it an invariable rule never to make a deep and free incision unless he is quite sure of the existence and precise situation of his object. The existence of an abscess having been determined, it is the usual practice to substitute the scalpel for any variety of puncturing apparatus, and to have recourse according to the situation of the cavity either to thoracotomy or some form of abdominal section. Thoracotomy, I believe, almost always implies a transpleural incision. When we have to deal with a large cavity at the upper and back part of the right lobe, I cannot see how, in the absence of adhesions, it is possible to approach the cavity without opening the pleural sac on the right side. The methods devised by Lannelongue and other French surgeons, of attacking the upper surface of the liver by a partial resection of the lower margin of the thoracic cage are not, I think, very satisfactory. I have tried Lannelongue's operation repeatedly on the dead subject, and found it very difficult to carry it out without making a free communication between the pleural and peritoneal cavities. Every surgeon who has had experience in the treatment of hepatic abscess must, I have no doubt, have often wished to discover a direct passage to the back of the liver. The transpleural operation is theoretically a most unpromising and indeed a risky one. In my experience, whilst with abscess in front necessitating an abdominal operation, we usually meet with adhesion in attacking the more frequent form of posterior abscess from behind, we so often find both the lung and the liver quite free and their respective serous cavities quite open. Consequently, in this operation we expose two large serous cavities and so double the risks of infection. Then again, there is usually, though not always, a difficulty in preventing ingress of air into the pleural sac and collapse of the lung. Still, notwithstanding these causes of danger, the transpleural operation in suitable and favourable cases has, on the whole, been a satisfactory one, perhaps more satisfactory than any cutting operation for liver abscess. In Malbot's list of cases, to which I have already referred, whilst four deaths occurred in eleven instances of abdominal or anterior operation, a mortality of about 36 per cent., of eight cases of transpleural operation two only were fatal. In the transpleural operation after removal of a portion of the seventh or eighth rib the diaphragm is often found so far elevated and pressed upwards as to bulge into the wound and thus to prevent the passage of external air into the chest. The surgeon's chief care at this stage is to guard against the risks of subsequent infection of pleura and peritoneum. I have myself usually followed the not infrequent practice of making a free incision of both diaphragm and liver, so as to allow a full and uninterrupted discharge of the fluid contents of the abscess. Such a course has, I believe, been very frequently followed by many surgeons without bad results, and it is one that from a strictly technical point of view has its advantages. Sooner or later, however, one might have to regret a constant and indiscriminate practice of this kind, and meet with an unfortunate exception to the rule that the contents

of a liver abscess are absolutely sterile. Great caution ought naturally to be exercised in cases of mixed infection, and when the patient presents symptoms suggestive of some form of septic poisoning. It would be well, I think, in every case of doubt—and, indeed, in every case of liver abscess—to apply our tests for both general and local leucocytosis. The puriform fluid withdrawn at the exploratory puncture should be examined under the microscope before further steps are taken by the surgeon, who, if he learns that leucocytes are present, should make it his endeavour to shut off both the right pleural and the abdominal cavities before he opens and empties the cavity in the liver. This stage of the operation has, I venture to suggest, both difficulties and uncertainty. I have not much faith in suturing. This is not only a long and tedious, but also, I believe, a very unsatisfactory procedure. After the most careful stitching, whether of parietal pleura to diaphragm or of diaphragm to liver, one often sees gaps here and there, and even the closest application of two margins or two narrow zones of serous or muscular tissue may, if the contents of the liver abscess be very virulent, fail to prevent an infective pleurisy or peritonitis. The course I would myself prefer in any doubtful case would be an application of Volkmann's method by plugging the open wounds in the chest wall and diaphragm with sterilised or antiseptic gauze, and postponing for two or three days—if such delay were free from risk—the final stage of the operation.

I will not say much concerning the operative treatment of a liver abscess revealed by puncture of the anterior wall of the abdomen. In such cases most surgeons, I believe, would practise abdominal section, which would usually be one of a somewhat limited extent. This, from a technical point of view, would be a simpler and more satisfactory operation than transpleural section, as we need not open more than one serous cavity, and very probably, in consequence of the frequent if not almost invariable presence of adhesions, may pass the knife directly into the abscess without any exposure of the peritoneal cavity.

Before concluding I might state that the surgeon has a free and wide range in the treatment of abscess of the liver. I see no reason why he should not operate in cases in which the patient is still suffering from dysentery, but this is a question for the physician to decide. The coexistence of two or more tropical abscesses need not be a contra-indication, as instances have been recorded, and I have had one such under my own care, of successful operations on three distinct cavities. The only cases in which I would refrain from operating, excluding those in which the patient is much exhausted and almost moribund, would be cases in which there were clear indications of a spontaneous rupture of the abscess into the right lung.

In concluding this paper I think that I may fairly assert that surgeons in this country, by adopting the methods and following the teaching of their much more experienced colleagues abroad, have succeeded in improving to a considerable extent the prospects of operative treatment in cases of tropical abscess of the liver.

THE RELATION OF DYSENTERY TO MALARIA.—Drs. S. Kanellis and J. Cardamatis, of Athens, publish the results of their investigations on dysentery in relation to malaria. Their conclusions are: (1) that so-called pernicious dysentery is not caused by any one particular organism; (2) dysentery is not primarily caused by malarial infection; (3) although malaria may produce an intestinal flux, the two diseases may run concurrently, but independently, of each; (4) dysentery should be eliminated from the list of sequelæ attributable to malaria.—*Progrès Médical*, May 19, 1900.

Current Literature.

MALARIA.

PROFESSOR KOCH has completed his tour in different parts of the world, which he undertook for the purpose of studying malaria and other tropical diseases. Professor Koch affirms that in Egypt malaria is endemic in the Delta of the Nile—a fact which has been frequently contested.

MOSQUITOES IN THE ARCTIC REGIONS.—Dr. Irving C. Rosse, in an article on mosquitoes and malaria, mentions that in Arctic regions life is rendered almost unbearable by the bites of legions of mosquitoes, yet neither the natives nor travellers ever suffer with malaria. This, however, proves nothing except perhaps that the mosquitoes were not anopheles, or if anopheles they were not injected with malarial germs. Probably also the Polar regions are not suitable for the development of malaria, or it may be that its power is shaken by the intense cold. Dr. Rosse spent some time at the mouth of the Delaware, and also in Monte Carlo and other malarial districts. In all these places he and his companions were bitten by mosquitoes, yet not one acquired malaria. It may be, however, that "exceptions prove the rule"; moreover, so many factors play a part in the transmission of disease, such as the constitution of the individual, and his predisposition to illness, that no precedent can be drawn from the facts called attention to by Dr. Rosse.—*Boston Med. and Surg. Journal*.

NOTES ON MOSQUITOES (by the late Miss Charlotte Hanbury).—Travelling in many lands infested with mosquitoes taught me the necessity of having constantly at hand a complete protection against them. The most effective plan for head and neck is mentioned by Sir John Hay in his "Western Barbary." He used a bonnet and veil, but I am persuaded that the best thing is a crinoline hat, cut away behind in the neck and with sufficient veiling that is fine, but cool, to envelop every part of the head, neck and shoulders, thus making a complete defence that can be always ready. It must go flat in any bag and come out only for its work to keep the veil far away from one's self. It takes scarcely any room, and with its trimming bears all crushing. Before knowing this remedy when at the islands on the West Coast of France—Rey, Oleron, &c.—I encountered giant mosquitoes quite unprepared. They hummed like small trumpets, and forced me to do something. Happening to have some gutta percha tissue, I cut a large mask with very small eyes, nose and mouth, and well tied on; it answered perfectly, being cool, but quite impervious to their sting. In vain they buzzed loudly and sought an entrance—the attacks were baffled. It requires another covering for the neck and shoulders. When in swarms of gnats, &c., biting ankles, disturbing hours of rest in the evening, it is a great relief to have a cool loose bag at hand to enclose feet and ankles safe from all reach. We frequently rode into tracks beset with flies so painful to animals; our attendant said they would kick everything off their

backs if stung. The horses and mules knew the enemies around, and sought to keep their noses stretched down to the sand. Wishing to escape the agitation that was beginning, and especially the general kicking, I had fine good net secured round their faces which removed the whole trouble.—*Climate*, January, 1901.

TYPHOID.

TYPHOID FEVER IN SOUTH AFRICA.—It was stated recently, in reply to a question in Parliament, that there had been 15,625 cases of typhoid fever among the British troops in South Africa, and that of this number 3,642 proved fatal.—*Med. Record*, December, 1900.

THE TREATMENT OF TYPHOID FEVER AT THE NEW YORK HOSPITAL.—By Dr. Frederick L. Keays. Baths are given every three hours, after the temperature reaches 103° F. The bath is started at a temperature of 80° F. and diminished in the two or three following baths to 70° F. Moderate degrees of cyanosis or shivering are not considered contraindications. Warm milk is given and hot-water bottles placed at the feet, if the blueness and shivering continue. When tub baths are contraindicated, alcohol sponges are substituted for the baths, the alcohol being cooled by ice. A modification of this is to have one person sprinkle the patient's body with alcohol, by means of a whisk broom, while another hastens evaporation with a fan.

Sodium bromide, from 15 to 30 grs., phenacetine, and acetanilide are used to relieve the headache appearing in the first weeks of the disease. The ice cap is also used. Trional, from 10 to 20 grs., given in hot milk is used as a mild hypnotic. Each patient is ordered a mouth wash, made by adding tincture of myrrh, 1 drachm, and sodium bicarbonate, 30 grs., to water, 4 ozs. This prevents such complications as parotitis and otitis media. Calomel and saline purgatives keep the bowels open in the early stages of the disease. When whisky or brandy fail to hold the pulse, strychnine sulphate is used, and if still more stimulation is needed, digitalis is given. Bronchitis is disregarded, unless it is extensive or troublesome, when the ordinary remedies are employed.

Milk is the routine diet. A little brandy or a few spoonfuls of coffee, or some malted milk, is added if plain milk is not acceptable. Kumyss or matzoön is substituted from time to time for variety. Patients who complain of hunger receive broths and beef juice, and when the temperature becomes normal, more active feeding is begun.

A FEW REMARKS RELATIVE TO TYPHOID FEEDING.—By Dr. William M. Brown. The author advocates the more liberal feeding of typhoid patients. The functions of digestion are attended by heat production, and proteids and carbohydrates giving the least number of heat units, while promoting the most effective digestive fluids, should be given. Milk unprepared is not a liquid food and will take as long to digest as many solid foods.—*New York Medical Journal*, December 8, 1900.

MISCELLANEOUS.

THE MICROBE OF CEREBRO-SPINAL MENINGITIS.—According to the *Thèse de Paris*, 1900, no single specific microbe is recognised for cerebro-spinal meningitis; infection may be produced by different pathogenic agents. In France the meningo-coccus of Weichselbaum is believed to be the actual etiological factor.

FRAMBÆSIA (Yaws).—In the Caroline and Marianne Islands in the Pacific Archipelago, Koch, from the examination of a number of children, has come to the conclusion that malaria is not endemic there, but that frambœsia (yaws) is very prevalent. — *Deut. Med. Wochenschrift*, No. 46.

MOSQUITOES COMMUNICATE YELLOW FEVER.—A board of medical officers of the War Department in Cuba have, according to their report to Surgeon-General Sternberg, demonstrated that yellow fever is spread through the bite of the mosquito. One of the board died as a result of the experiments. The board consisted of Dr. Walter Reed, surgeon U.S. Army, and Dr. James Carroll, Dr. A. Agramonte and Dr. Jesse W. Lazear, acting assistant-surgeons. During the experiments Dr. Lazear was bitten by a mosquito that had previously bitten a yellow fever patient. The doctor died of that disease after a short illness. Dr. Carroll allowed himself to be bitten by a mosquito that had previously fed on several yellow fever patients and suffered a serious attack of the disease. A civilian resident of the military reservation, a young American, whose name is not given in the report, was bitten by the same mosquito that bit Dr. Carroll and died of yellow fever.—*New York Medical Journal*, December 8, 1900.

HOW THE CHINESE DOCTORS FEEL THE PULSE.—It is well known that Chinese doctors attach great importance to the condition of the pulse and the study thereof. The following is the usual procedure:—The patient is made to lie down with his arm resting on a cushion. The doctor, seated by him, applies his fingers successively in order to judge of the compressibility of the artery. The number of pulsations is then compared with that of the inspirations and expirations. The Chinese doctors compute that four beats of the pulse should take place to one breath, to indicate normal health, and a greater or less number is reckoned as a sign of illness. They establish four sub-divisions for the pulse. According as the same is superficial, deep, quick or slow, it corresponds to four temperaments, choleric, hopeful, phlegmatic, or melancholic. Curious details in regard to Chinese and Mongolian medicine will be found in Mr. Matignon's recent work "Superstition, Crime and Misery in China."—Dr. L. Salvy, *Janus*, December, 1900.

DR. K. SHIMIZU, of Japan, highly recommends an infusion of cassia occidentalis as a prophylactic for stings of insects and snake bites, the infected parts to be bathed with this lotion.—*Janus*, December, 1900.

THE POVERTY OF TROPICAL COUNTRIES AS A CAUSE OF THE FEEBLENESS OF THE NATIVES, by F. Lemeleder,

M.D., Cordoba, State of Vera Cruz, Mexico.—All men dream of the marvellous riches of the tropics, of the birds with rainbow plumage, of the extravagant flowers, of the elegant tree ferns, of the banana and palms with waving leaves, and of the cocoa palm which furnishes man with everything necessary for life. Indeed, we pity him who has never seen a tropical landscape, as we pity him who has never seen the sea. Then we think of the enormous treasures the English, Spaniards, and Dutch have harvested from their tropical colonies, and naturally we think that the tropics are the richest regions of the world. All this may be true, yet nevertheless, in another sense, instead of being rich, the tropics are fatally poor. Unable to secure the necessities of life, the people of tropical countries are like the man in whose hand everything turns to gold, yet who perishes of hunger and thirst.

Of all the breadstuffs necessary for man, the tropics furnish only corn and rice, and these only to a limited extent. They have no wheat, rye, or potatoes. The banana may be, as Humboldt says, one hundred and thirty-three times more productive than wheat and forty-four times more so than potatoes, yet it cannot replace either as food. Nor can white men live for any length of time on rice and corn alone, nor on bananas and palm nuts. Native tropical foods can only hold body and soul together, as they furnish but little vigour, energy and power. No machine can do good work with poor fuel. A man who has neither bread nor meat cannot get life and strength and push from tea, coffee, sugar, vanilla, and all the precious spices. Tropical products are merely commercial luxuries, and if the inhabitants of cold climates did not buy them the people of the tropics would lack the necessities and comforts of life and would yet choke with their own riches.

If we wish to know the effects of the poor diet of the tropics combined with the effects of the heat, we have only to look at the inhabitants of these countries. As a general rule they are thin, poorly built, and unfit for intellectual or physical labour. Occasional exceptions will only confirm the rule.

Even the foods which are produced are insufficient in amount, so that the least interference with the annual crops results in famines, as is the case in India to-day. Indeed India has always been the land of fabulous riches of a few and of famines of the millions. Until recently in the cold countries there were none of fabulous wealth and but few famines.

Everything in hot countries is harmful to man; the ground, the water, and the air, swarming with miasms and vermin, and with torment and danger. Life is as much a torment as a pleasure, for whatever makes life worth living is lacking. They depend for indispensable necessities upon the temperate zones, to which they furnish only the luxuries.

Some one may mention the art, science, and culture of Hindostan, Ceylon, Java, and the tropical Americas. These were possible when the Aryans and other conquerors who had come from the colder countries had still preserved their original vigour and energy before they mingled with the former inhabitants and degenerated. Then we ought not to forget that all these great works were done when the

great institution of slavery placed tools in the hands of the conquerors to do work they themselves could not do in the heat. In our day, it is machinery, the great liberator of man, which does the work performed in those remote ages by the hundreds of thousands of miserable slaves.

The temperate zone is the one which breeds everything grand, and of these countries, and not of the tropics, Goethe sang,

"Nach der Wärme ziehen sich Musen,
Nach der Wärme Charitinnen."

Lord Macaulay, in his essay on Warren Hastings, *Edinburgh Review*, October, 1841, p. 174, in discussing the prevalent ideas of the wonderful riches of the Indies, said, "Nobody seemed to be aware of what nevertheless was most undoubtedly the truth, that India was a poorer country than countries which in Europe are reckoned poor; than Ireland, for example, or than Portugal. It was confidently believed by lords of the treasury and members for the city that Bengal would not only defray its own charges, but would afford an increased dividend to the proprietors of India stock and large relief to the English finances. These expectations were disappointed." Are not the people of the United States to be disappointed in the Philippines?—From the *Medical Record*, Dec. 22, 1900.

THE SOLDIER'S TROPICAL RATION.—(In an editorial this subject is dealt with in the *Medical Record*.) In the present conjunction of affairs, everything relating to the tropics concerns the inhabitants of the United States intimately. Thus the etiology and treatment, both preventive and remedial, of the diseases prevalent in those regions are questions of serious moment. All that can be learned with regard to the mode of life best suited to the preservation of the health of white men who make their home in tropical countries is devoured with avidity. Under existing circumstances the army in the Philippines is the focus of absorbing interest. Therefore the Report of the Board appointed to study the matter of tropical ration for American troops, and to suggest beneficial changes therein, will be attentively read by the general public. It goes without saying that diet is one of the most important of considerations when the rendering of a white man able to cope with his unaccustomed environment is the object in view. On this point opinions clash. There are those who insist that under no conditions can the inhabitant of the temperate zone dwell in perfect health in tropical lands. On the other hand, many men of experience state that, if these individuals live in a manner befitting the climate, paying strict heed to the laws of hygiene, and if, above all, they are discreet in eating and drinking, there is no valid reason why they should not enjoy good health. So far as the kind of food is concerned, a wide divergence of views exists. Some argue that an entirely different dietary is indicated in tropical countries, and that the person who imagines that he can thrive on the same description of food that he eats when at home, will be certain quickly to break down. Others assert that but a slight change of diet is needed from the ordinary fare of an American in his own country, and that if the stranger in the tropics endeavours to live as does the native, he will soon lose both

energy and physical power. Major Louis Seaman, late surgeon in the United States Engineers, is an upholder of the former contention, and writing to the *Medical Record*, says, "A personal experience in two of the latest tropical wars, and a study of the statistics of others, have led me to the conviction that the most prominent cause in bringing about the development of preventable diseases in both these wars was the misuse of food." Speaking generally, he considers that the majority of the diseases met with among troops serving in the tropics have their origin in improper food, in overfeeding, or in the abuse of stimulants; and he suggests a dietary scale containing much less meat and fat than was issued to the United States troops. Dr. Seaman is of the opinion that the ration was an excellent winter food, rich in the elements requisite for respiration under a low temperature; but for a tropical land, the enormous excess of carbon furnished by it to the lungs over and above that which they could dispose of, imposed upon the liver and kidneys additional duties of elimination, producing congestions, fermentation and catarrhs, dyspepsia and lithæmia, glycosuria and phosphaturia, interfering with metabolism, and creating conditions favourable to bacterial development, together with almost the entire train of diseases which have crowded our army hospitals. As remarked above, many medical men who have gained experience from a lengthened sojourn in the Philippines hold that meat is a necessity for the American soldier, and that, lacking it, his bodily powers will fail. The Board have cautiously steered a middle course, and while recommending that the fresh meat ration should not be reduced in quantity, declare that the problem is to find such a ration as will, by substitutes among its various ingredients, be suitable for all climates. Corn meal has been excluded from the ration, as have dried peas, for the latter of which oatmeal has been substituted. The sugar ration, as in all European armies, has been increased, and coffee has been retained. The action of the Board appears to be amply justified and will probably meet with the approval of the majority of those who have spent some time in the tropics. Fresh meat, fresh vegetables, fresh fruit, supplied in sufficient quantities, should tend to preserve the health of the dweller in tropical countries, and wherever obtainable will undoubtedly meet the exigencies of the situation better than embalmed meat and canned vegetables. Universal agreement prevails on the point that alcoholic drinks are almost invariably injurious to the white man in the tropics. It may be said that when the problem of the most healthy diet for the foreigner in the tropics is solved, the greatest obstacle in the way of rendering these countries salubrious will have been overcome.

TENIA FLAVOPUNCTATA.—Frederick A. Packard describes a parasite taken from a Syrian woman aged 40. One specimen was passed during life and another was taken from the intestine after death; the latter was 27 cm. long and different from the former specimen in no way except by the presence of the head and of a short neck, and by its colour. The specimen passed during life was brownish-yellow,

while that found at autopsy was almost pure white with a faint yellow tinge. This specimen consists of a head and a short neck separated by a slight constriction, and of a segmented body. The head is black at the tip, the pigment being arranged somewhat like the leaves of a four-leaf clover, as though each division represented the sucking-discs seen in other *tænia*. No distinct cupping is visible. At a distance of 1.5 cm. from the head, distinct transverse striations are seen, which evidently indicate division into proglottides. There is no branched arrangement of the egg-sacs nor any central clumping as in the *bothriocephalus latus*. This cannot be a *tænia* common to this part of the world, nor is it an example of *bothriocephalus*. It must, the writer believes, be a specimen of *tænia flavopunctata* which has been described but six times as occurring in the human subject.—*Med. Record*, December 27, 1900.

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 F.—Staff-Surgeon R. A. Fitch (Port Elizabeth).
 G.—Dr. F. Oscar Guérin (Mauritius); Dr. J. C. Graham (Deli).
 H.—Dr. W. C. Hossack (Calcutta).
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 M.—Dr. A. Yale Massey (Benguella); Dr. A. Morrison (Alexandria).
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 R.—Dr. W. N. Robertson (Queensland).
 W.—Dr. E. G. Williams (Boreham Wood); Sir Francis P. Winter, C.M.G.

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Annali di Medicina Navale.
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 Australasian Medical Gazette.
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 Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.
 La Grèce Médicale.
 Lancet.
 Liverpool Medico-Chirurgical Journal.
 Medical Brief.
 Medical Missionary Journal.
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Original Communications.

CASE OF RHINORRHOEA.

CILIATED ORGANISMS MET WITH IN THE DISCHARGE.

By A. B. DALGETTY, M.B., C.M.

South Sylhet, India.

THE following peculiar case of rhinorrhœa may be of sufficient interest to publish.

The patient, who is a Hindu coolie, was shown to me one day as she was suffering from extreme anæmia. While examining her I noticed that she had a steady dripping of a clear fluid from one nostril, and on questioning her found that this had been going on for about three months. The liquid was dropping away at the rate of four drops a minute, and continued day and night; only when she lies on her back it drains backwards into the throat. It comes entirely from the right nostril. At first sight it looked like one of those rare cases of escape of cerebro-spinal fluid through the nose, but an examination of the fluid corrected that impression.

The following are its characters: Colour: opalescent, with trailing, hazy bands throughout, denser at bottom. Odour: peculiar, sickening, faintly like that of honey. Specific gravity: 1003. Reaction: alkaline, no sugar and no albumin. The alkalinity was due to the presence of sodium phosphate as shown by chemical analysis. Microscopic findings: a few cocci and diplococci were seen, but that which immediately arrested attention was the multitude of ciliated organisms darting and turning and doubling about in all directions. They are somewhat elongated, globular bodies, about 25 μ long and of half that breadth, provided with an elastic body-wall covered

with short cilia disposed over the whole surface and without any special adoral band or fringe. In certain positions a slight indent in the contour marks the position of the mouth. The body-contents are more



X400



1.

(a) Mouth, (b) vacuoles.



2.

Dead specimens.

or less granular and at least one, or more often three or four, rounded clear vacuoles occupy the hinder end. These vacuoles frequently evacuate their contents and as rapidly fill up again.

The organisms are mostly of one uniform size, but numbers of smaller ones also exist, as shown in the ring-drawing. I tried to discover the method of reproduction but cannot say I succeeded: at times it seemed as if true conjugation were taking place. Drying up of the surrounding fluid puts an end to

their movements, which cannot be restored by applying fresh fluid and heat even after only a short interval. The organism would seem to belong to the Order *Holotricha*; Genus *Paramæcium*; but to what species is doubtful. It is smaller than the ciliata which one finds in the intestine of the cockroach, and it seems to differ also from the *P. coli* which is sometimes parasitic in the intestine of man and causes symptoms of dysentery (*vide* fig. 593 in "Hamilton's Pathology," vol. ii., pl. 2).

As to how the organism has gained a footing in the nose, there is nothing to show, nor does a rhinoscopic examination from the front discover from what part the discharge comes. So far I have not been able to get a good view of the nares by the posterior method. There is a little redness of the middle and inferior turbinated bones of the right side, but that is all I have noticed. The anæmia from which the patient is suffering need have no necessary connection with this other condition, which seems to be entirely a para-phenomenon.

CEREBRO-SPINAL MENINGITIS.

By E. G. HAMILTON WILLIAMS, D.P.H., M.R.C.S., L.R.C.P.
and MARY HAMILTON WILLIAMS, M.B., B.S.Lond.,
D.P.H., Cantab.

Special Service Medical Officers, Ashanti Field Force.


(A previous communication on "Cerebro-spinal Meningitis," by the same authors, will be found in the Nov., 1900, issue of the Journal.)

At the time of writing our last account it appeared that the epidemic was ending; but in this we were mistaken. Fresh cases continued to arise, and were noted nearly every day until the date we went off duty previous to our return to England, but the type of disease showed a steady lessening of severity. Many of the cases were undoubtedly of the mild type described by all authorities on this disease (Osler, Albutt, &c.), in which the complaint merely took the form of a few days' malaise, headache, giddiness, with slight fever. In each of the severe cases we had found the diplococcus in the peripheral blood during life; we found it also in the cases of only moderate severity, but yet presenting distinctive symptoms, such as retraction and rigidity of the head; and consequently we diagnosed the same disease in patients, seen at the same time, and in the same place, whose only symptoms, possibly, were giddiness and some headache with slight fever or malaise, yet who on examination of the finger blood presented diplococci and no malarial plasmodia. Two of these last mentioned cases suffered concurrently from another disease, one from liver abscess, and one from smallpox. These two cases were not under our care, and we do not know whether the presence of the one disease influenced the course of the other.

Altogether we found the diplococci in over 80 cases, and in some of these we found it when the symptoms were slight, but a few days later became unmistakably severe. On examining the blood the first point noticed in nearly all cases, was the marked polynuclear leucocytosis; and when we found this in a high degree the further investigation of other fields

rarely failed to reveal the characteristic diplococci. It appears to the writers that this method of diagnosis, if confirmed by other observers, may lead to the recognition in the presence of an epidemic of many slight cases, which would otherwise be treated as "bilious attack," "febricula," &c., &c., and arguing from the analogy of diphtheria, these slight cases may yet give rise in another patient to a severe attack. In addition, many obscure sporadic cases of the disease may be recognised and the origin of outbreaks, which may have started from a very slight imported case, explained. In addition to finding the diplococcus in the blood, we found diplococci in the sweat in such numbers as to suggest that this is one method of elimination; but until the organism has been isolated in pure culture from this source one cannot be sure of its identity although its presence is sufficiently suggestive as to render extreme enforced personal cleanliness among the patients a most desirable prophylactic measure.

We believe that we detected the same organism in the saliva, nasal secretion and the urine.

We obtained cultures on agar from the blood taken from the ear of a patient, the operation being conducted aseptically. From these first cultures films were made showing the diplococci with only slight impurities, but as we had no means of obtaining this culture in a pure condition, before reaching England, six weeks later, another organism had outgrown and killed the diplococci. The original growth on agar consisted of small, circular, scattered, whitish colonies growing at the body temperature (the tubes had to be worn during the journey, &c.) Microscopically the organisms were arranged as diplococci frequently occurring as double rows, thus  or in sarcinae-like groups. They were not capsulated, did not retain the stain by Gram's method, and varied much in size. We found the diplococci in five cases in Europeans, four of whom were much exposed to infection. The following description of one of these five European cases is given as being fairly typical of a "slight" case. It began with sharp abdominal pain, nausea and purging; this passed off in a few hours, the patient meanwhile working as usual. General malaise, headache and slight rise of temperature then lead to a search being made for plasmodia, but diplococci were found instead. (This patient had previously had several attacks of fever, in each of which plasmodia had been found.) The next day there was great giddiness, headache, photophobia, shooting neuralgic pain in the back and limbs, insomnia and weakness, and a marked feeling of inco-ordination on trying to cross the room. There was also acute tenderness over certain of the upper dorsal and lumbar vertebræ. The temperature stayed between 99° and 101° F. There was no regular evening rise. In five days the patient returned to work, but continued to suffer from photophobia for about a fortnight, while insomnia and headache lasted for some weeks; and even as long as ten weeks after, reading or mental exertion produced undue fatigue and headache.

The questions which arise are:—If Weichselbaum's diplococcus is pathognomonic of the disease, is it

always in these cases to be found in the peripheral blood?

Secondly, is the very high mortality recorded in some epidemics of cerebro-spinal meningitis due to an increased virulence of the diplococcus, or is it due to a different organism?

Thirdly, is the presence of the organism in the sweat one of the chief factors in the dissemination of the disease?

A CASE OF HEMIPLEGIA: OPERATION; RECOVERY.

By A. A. BENNETT, M.B. LOND.

St. Margaret's Hospital, Old Calabar, S. Nigeria.

Particulars of Case.

May 30.—Patient admitted with history of sudden loss of consciousness, followed on recovery by weakness of right leg and arm.

On admission.—Marked rigidity whole of right side, knee-jerks both sides; no ankle clonus. Slightly diminished sensation right side; no facial paralysis. Patient can talk and understand what is said to him, but is dull and lethargic; passes water in bed.

June 1.—Patient had two fits in the evening, the convulsion being confined to the right arm and leg. When seen there was complete unconsciousness; total paralysis of arm and leg. Knee-jerk absent, pulse rapid, regular; breathing shallow and stertorous; pupils dilated. Passing urine and faeces in bed.

June 2.—On recovering from the coma, patient rapidly fell into same state as on admission; considerable spasticity returned. Still understands what is said to him, but has difficulty in answering any questions.

June 4.—Condition unchanged; takes food well; motor aphasia present.

June 6.—No change.

June 8.—Slight convulsion yesterday, followed for a few hours by complete relaxation of leg and arm; leg slowly regaining spasticity.

June 12.—Rigidity again marked; aphasia complete.

June 12-21.—During this time patient's condition became gradually worse. For a few hours some improvement would be noticed, patient taking a more intelligent interest in his surroundings, and making some attempt to move his right arm or leg. For the most part, however, he was dull and apathetic, not attempting to speak nor appearing to understand what was said to him. The rigidity of the right arm and leg increased, urine and faeces were passed in bed with greater frequency, and though food was taken the amount was small, and the patient steadily wasted.

June 21.—Patient was trephined over left Rolandic area. Brain bulged into the wound and there was no pulsation; brain explored in all directions with needle and nothing found. Dura mater freely incised and an induction current passed through the exposed convolutions. Muscular contractions observed in leg and arm. Patient much collapsed after operation.

June 22.—Condition unaltered; patient puts out tongue when told to, but gives no other signs of intelligence.

June 26.—Patient improved considerably since last note, can move himself independently and sit up in bed; evidently understands what is said to him; can move right leg and foot, and right arm to a less extent. Eats well; passes motions under him.

June 27.—Patient spoke distinctly this morning. On being asked what his name was, replied at once. Condition of right leg and arm unchanged. R.D. present in both.

June 30.—Continues to improve; appears to take an interest in what is going on around him. Right arm and leg have been massaged daily and had continued current ten minutes. Since last note patient now moves right leg well, and arm slightly. Eats well; passes everything under him; very irritable when spoken to.

July 2.—Can move right fingers slightly, right leg well; is dull this morning. Still defaecates in bed, but uses urinal as a rule.

July 7.—Improvement continues; patient said "good morning" to-day. Asked for bed-pan; eating well.

July 10.—Patient crawled to ward table yesterday and had breakfast with other patients; very angry when the patients insisted on eating their own share of the meal. Less dull from day to day; wound healthy; no change in physical signs.

July 17.—Continues to improve; walks to table every day; yesterday went out on verandah. Still moves leg better than arm; intelligence much the same.

July 20.—Patient passed motions under him several times the last two days, but evidently does so only with intent to annoy the attendants.

July 25.—Patient discharged to-day practically well. During last two days he tried several times to run away from the hospital, and once nearly reached the top of Consulate Hill. At present he is almost as intelligent as he ever was, which is, perhaps, not saying very much; at least he understands what is said to him, and occasionally volunteers a remark himself. The right arm and leg are still weaker than the left, but apart from this do not differ in any respect. Finally, patient is eating very well, and has put on many pounds in weight since the operation.

THE PREVALENCE OF MOSQUITOES AND MALARIA IN HONGKONG.

By J. C. THOMSON, M.D., M.A.

THE following preliminary report, dated November 3, 1900, regarding a research into the prevalence of mosquitoes and malaria in the Colony of Hongkong and in the New Territory, is published by the Government of Hongkong.

There are two distinct species of *Anopheles* abundant in the Colony, differing in size, general appearance, and the markings on the wings. The smaller, which I believe to be *Anopheles costalis*, is prevalent all over the Colony and in the ravines to the south of Magazine Gap; the larger, *Anopheles sinensis*, is the more common throughout the New Territory, on the Islands, and at Stanley and Pok-

fulam. While the area of general prevalence is thus different, it is not exclusively so, as I have myself caught *Anopheles sinensis* in the centre of the city, in a hotel not far from the Clock Tower, while *Anopheles costalis* has been included in some of the consignments from the mainland.

I have differentiated at least eight distinct species of *Culex*, but I prefer not to commit myself to the naming of them until my classification has been confirmed or amended by an expert entomologist. To secure this I have sent to the London School of Tropical Medicine fifty-four mounted specimens, consisting of fourteen different species of mosquitoes, two species being *Anopheles*, eight species at least being *Culex*, and the remaining four species probably belonging to other genera of the mosquito family, though one or two of them may prove to be species of *Culex*. All the above have unspotted wings, excepting the *Anopheles* and a single species of *Culex*, of which I have obtained only a single specimen. This I believe to be *Culex mimeticus*, and it is manifestly very rare. A good general rule, therefore, in Hongkong, in addition to the differences of the head appendages and the characteristic attitude when at rest that distinguish *Anopheles* from *Culex*, is, that a mosquito with spotted wings is probably one of the dangerous *Anopheles*, and one whose wings are unspotted is a *Culex*. I have privately submitted a few of the more prevalent types of both genera for His Excellency the Governor's inspection.

From my own observations, supplemented by those of Dr. T. M. Young, Civil Surgeon, R.A.M.C., with whom I have been working in co-operation since his arrival in the Colony in August, and who has given his attention more especially to the question of the breeding-grounds of the *Anopheles* mosquito in the Colony, I am of opinion that *Anopheles* breeds, or may breed, in the more stagnant shallows, and in the rocky corners and crevices, of any or all of the ravines in the Colony, and is practically confined to these during the greater part of the year. I wish it to be explicitly understood that my remarks on this subject apply to the city of Victoria itself, and not to flat grounds in outlying districts where all the conditions are different. The usual *habitat* of the larvæ of the *Anopheles* mosquito is the natural water-courses, and their favourite locations little breaks in the rocky surface by the side of the stream, where the merest trickle from the stream itself prevents entire stagnation, and where there is no through-wash of water.*

So far as the city of Victoria is concerned, therefore, the configuration of the ground greatly simplifies the question of dealing with the *Anopheles* pools. It reduces itself to the training of all the nullahs that are as yet untrained. The clearing away of undergrowth is an important adjunct to more radical measures, inasmuch as it removes cover where mosquitoes may rest, but it is to be regarded as entirely subsidiary to the destruction of the breeding pools; and this can only be effected by the conversion of the uneven ravines into well-paved nullahs. In the latter no *Anopheles* can breed,

since in the running water there is no resting place for the evolution of the egg and the development of the larva. This has fortunately already been done in the central part of the city.

The first untrained nullah as one proceeds westward is that to the west of the Nethersole Hospital, just above Ripon Terrace on Bonham Road. I have repeatedly satisfied myself by personal observation of the presence of *Anopheles* larvæ in this ravine, and the marked prevalence of malarial fever in houses in this neighbourhood is sufficiently accounted for.

The extirpation of malaria in the western part of the city, which has in the past had such an evil repute as regards this disease, consists in the levelling or covering in of all the watercourses, beginning with the one I have named, and dealing with all between that and Kennedy Town. If this were done, malaria would largely disappear from the district, many sites hitherto avoided would probably ere long be made use of for the erection of European houses, and the fuller opening of this large area to building operations would be not unwelcome in the present congested state of the city.

And here I would point out that the one water-course in the west that has been to some extent trained in the pre-mosquito-malaria-theory days has been so trained that it is a perfect hotbed of malaria. I refer to the nullah passing down in front of the Public Mortuary. It has been trained in a series of dams and terraces, which while excellent for breaking the force of a mountain torrent on the rare occasions when this is necessary, form during most of the year a series of shallows in which the larva of *Anopheles* abounds. It is urgently desirable that these terraces should be levelled out, and a smooth channel made for the stream, extending at least as high as the Pokfulam Road.

I shall be glad to examine and report on other particular localities, if desired by His Excellency to do so.

Concurrently with my enquiry into the prevalence of *Anopheles*, I have been investigating the prevalence of the malaria parasite in the Colony. Its connection with *Anopheles* is now an accepted fact. The general mosquito-malaria theory has been proved to the hilt, and has recently been brilliantly demonstrated to the public by Manson's double experiment; but the connection of malaria with disturbance of soil, an important point in Hongkong, is by no means clear as yet. Grassi disposes of the subject by stating that it depends on the creation during digging operations of puddles of water in which *Anopheles* breeds. This certainly does not hold for Hongkong. The whole of the broken earth surface may show no single puddle, the sun drying the superficial layers as they are turned up; and yet it is a fact of experience that in certain parts of the Colony earth cutting is invariably attended by an outbreak of fever. On the other hand there is undoubtedly some connection with the presence of moisture in the soil—in certain localities, e.g., around MacDonell Road, where earth cutting may go on to an unlimited extent with impunity, I find that the soil is comparatively dry; while in others, e.g., the west point already referred to,

* Vide Addendum.

where the slightest excavation inevitably produces fever in the neighbourhood, I find that the soil is more or less water-logged. I propose to give attention to this question, which is one very seriously affecting this Colony.

My chief field of observation as to the prevalence of the malaria parasite in the Colony has been the Tung Wah Hospital, where Dr. Chung has at my request been recently examining microscopically the blood of all cases of fever, and daily submitting specimens for my personal examination at my visit of inspection.

There are three main types of malarial fever, associated with different and corresponding parasitic organisms, and all the three types of the parasite I have found prevalent in Hongkong:—the benign tertian parasite, easily yielding to the action of quinine; the quartan parasite, readily brought under control by the same drug, but difficult to eradicate; and the malignant parasite, variously described as æstivo-autumnal by Italian observers, tropical by Koch, pernicious, &c., less amenable to quinine, more severe in the resulting symptoms, and more apt to produce a fatal result or prolonged ill-health.

Of fifty cases in which, up to October 31, parasites were found, and their form and type recorded, three came from Kennedy Town, eighteen from the west part of the city, thirteen from the central parts of the city, six from the east part of the city, two from Happy Valley, and eight from outlying villages.

The most common type of the parasite in the cases which I have examined has been the malignant parasite, with abundant crescentic forms; but I do not consider that this gives the true proportion of the prevalence of the different parasites in the Colony, since probably only the more serious cases of fever find their way into the hospital wards.

There has recently been a small epidemic of fever in the neighbourhood of the Naval Hospital and Morrison Hill Road. My first opportunity of personal observation in reference to it occurred on October 27, when I was requested to see the family of a European government officer whose four children had all suddenly become ill with high fever. I took a microscope to the house, and found the benign tertian parasite in the fresh blood of three out of the four cases. All readily yielded to quinine, and by November 1, they were back at school. I requested the father of the patients to catch for me some of the mosquitoes frequenting the house, and the first he submitted was a specimen of *Anopheles costalis*.

While pursuing this investigation into the prevalence of mosquitoes in the Colony and its dependencies chiefly with reference to the question of the presence of *Anopheles*, and the means to be adopted for its extermination, my attention has been directed most forcibly to the enormous prevalence of mosquitoes of the genus *Culex*. As has been mentioned, I have differentiated at least eight species of this genus. The *Culex* mosquito does not, so far as is yet ascertained, act as a host to the malaria parasite; but it as well as *Anopheles* is certainly the intermediate host of the minute parasitic blood-worm, the *Filaria nocturna* or *Filaria san-*

guinis hominis, whose adult form lies in the lymph vessels, and is the cause of the great group of elephantoid diseases. Elephantiasis is quite common among the Chinese in this region, though, for some reason not yet sufficiently explained, Europeans are as a rule exempt from it, an exemption, however, by no means complete; but most Europeans are affected by the immediate disagreeable effects of the bite of the mosquito, and few are aware that the daily supply of these vicious little insects is being produced in their own houses.

I think public attention should be drawn to this fact. I would like to write it in large capitals, that I HAVE FOUND THE LARVÆ OF *CULEX* IN PROCESS OF DEVELOPMENT IN ABUNDANCE IN OR ABOUT EVERY HOUSE WITHOUT AN EXCEPTION IN WHICH I HAVE LOOKED FOR THEM. A few instances will illustrate the great variety, and also the common general character, of their breeding-places:—at the Alice Memorial Hospital I found them in an old teapot on the roof-balcony; at the Tung Wah Hospital, in the ornamental flower-stands; at the Gaol, in an empty pot in the coal store; at Kennedy Town Hospital, in the fire buckets; behind a house at the Peak, in a disused hand-basin; in another house at the Peak, in a dish placed to catch the water-drippings from the ice-chest, &c. In all these cases they were in abundance, and were daily giving off large numbers of full-grown mosquitoes for the supply of their respective localities.

The crusade against the mosquito should include the *Culex* as well as the *Anopheles*. *Anopheles* must be dealt with by the Government chiefly, though owners of property may probably find it to their advantage to move privately in this matter as well; but *Culex* can be exterminated, or at least greatly diminished in numbers, by individual action alone. It may be impracticable to secure individual action of a sufficiently wide-spread character to make much impression on the sum-total of the *Culex* mosquitoes in South China, but every householder in Hongkong has it in his power by due attention to his verandahs, back-yard, and coolie quarters to secure that in his own house at least there shall be fewer mosquitoes in the future than there have been in the past. Many are aware that what they have often seen in such receptacles as I have described are the larvæ of mosquitoes; but few realise that these same wriggling creatures will a few days later rise from the surface of the water as adult insects, and will probably find their first meal of blood within the house that harboured them in the larval stage.

ADDENDUM.

Since the foregoing was written, a fact of very great practical importance has been brought to my notice by Mr. W. J. Tatcher. The *Anopheles* occasionally departs from its usual habits, and may breed in artificial collections of water. With Mr. Tatcher I yesterday examined one of the Chinese flower-nurseries at West Point, that to the east of the house called "Nullah Side" from its location, and found in many flower-pots containing water the larvæ of *Anopheles* and *Culex* abounding side by side in the same vessels.

This observation does not affect the practical deductions I have already drawn regarding the usual breeding-grounds of the *Anopheles*; but, though I think it will be found that what I have above noted only occurs in the immediate vicinity of *Anopheles*-containing ravines, it greatly intensifies what I have said as to the desirability of every one doing his best to prevent vessels containing water from standing about yards or verandahs without being frequently completely emptied.

With reference to these Chinese gardens at West Point, I would recommend that the Sanitary Board should be requested to cause an officer to periodically inspect them, and treat as a nuisance any vessel containing visible larvæ.

Before making this recommendation I have received the assurance of Mr. Tutchet, that the vessels containing the larvæ were not in a stagnant condition for any reason connected with the flower-producing industry, and could equally well be kept fresh; and in a neighbouring garden which I visited this morning in pursuance of my enquiries I found as many vessels containing water, but hardly any containing larvæ. The owner of the garden told me that he frequently empties all dishes on account of what he called the water-mosquitoes. It would therefore be no hardship to insist on these nursery-men keeping their gardens in a condition better calculated to promote the public health.

J. C. T.

CASE OF BRONCHOCELE IN A NATIVE OF PERAK, MALAY STATES.

By P. G. EDGAR, M.B., C.M.Edin., L.M.Dublin.

(Accompanied by Photographs. See plate.)

THE patient is aged 48, and was born in the Kwala Kangsai district of Perak, where the disease is endemic; it is largely prevalent in both sexes, but especially among the women. Kwala Kangsai is a mountainous district and geologically composed chiefly of limestone.

The swelling commenced in the patient's twentieth year of life, when it was the size of a marble; it gradually enlarged until it reached its present dimensions. Both lobes of the thyroid are enlarged, and the nature of the enlargement appears to be cystic. Beyond the sensation of dragging about the throat the patient does not suffer from dyspnœa or dysphagia, whether sitting, standing, or lying on his side. Lying on his back, however, produces dyspnœa owing to compression of the trachea from the weight of the tumour. The Malays attribute the origin of the disease to the water, especially that obtained from the Kwala Kangsai river. The patient's mother and sister also had bronchocele. There is no exophthalmos, and the pulse is 72 per minute.

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- 3.—All business communications and payments should be sent to P. Falcke, Secretary to the JOURNAL OF TROPICAL MEDICINE. Cheques to be crossed London and South Western Bank, Great Portland Street Branch, London, W.
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THE

Journal of Tropical Medicine

JANUARY 15, 1901.

IMPORTANT NOTICE.

BRITISH CONGRESS ON TUBERCULOSIS FOR THE PREVENTION OF CONSUMPTION.

President—H.R.H. The Prince of Wales, K.G.

EXECUTIVE OFFICERS.

Chairman of Organising Council—Sir William Broadbent, Bart., M.D., F.R.S.

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Hon. Secretary-General—Malcolm Morris.

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Hon. Secretary of Reception Committee—Alfred Hillier, M.D.

20, Hanover Square, London, W.

OBJECTS OF CONGRESS.

His Royal Highness the Prince of Wales has graciously consented to open in person a British Congress on Tuberculosis in the Queen's Hall, London, at 3 o'clock in the afternoon of Monday, July 22, 1901; and it has been decided that the Congress shall be held from Monday, July 22, to Friday, July 26.

Every British Colony and Dependency is invited to participate by sending delegates; while the Governments of countries in Europe, Asia, and America are invited to send representative men of science, and others, who will be the distinguished guests of the Congress.

The information already gained, both at home and abroad, shows that consumption and other forms of tuberculosis, although preventable and controllable by intelligent precautions, still remains the direct cause of a high rate of death and sickness. In the United Kingdom alone some 60,000 deaths are recorded annually from tuberculosis, and it is stated on good authority that at least thrice this number are constantly suffering from one form or another of the disease.

The knowledge of these facts, and the recognition that the disease is peculiarly amenable to open-air treatment, has aroused profound International interest in the question; and in many countries public authorities have been led to put in force preventive measures directed against the propagation of consumption between human beings, between animals, and between human beings and animals.

The object of the forthcoming Congress is to exchange the information and experience gained throughout the world as to methods available for stamping out this disease. Papers will be read, and clinical and pathological demonstrations will be given; while the museum, which is to be a special feature of the Congress, will contain pathological and bacteriological collections, charts, models, and other exhibits.

Authorities in this and other countries will be invited to supply documents bearing upon the historical, geographical, and statistical aspects of the subject; while as a result of the papers and discussions, practical resolutions will be formulated which will serve to indicate the public and private measures best adapted for the suppression of tuberculosis.

The work will be divided into four sections as follows:—

SECTION I.—STATE AND MUNICIPAL.

President—Rt. Hon. Sir Herbert Maxwell, Bart., M.P., 49, Lennox Gardens, S.W.

Secretaries—Dr. Bulstrode, L.G.B., Whitehall, S.W.; Dr. James Niven, Town Hall, Manchester.

SECTION II.—MEDICAL, INCLUDING CLIMATOLOGY AND SANATORIA.

President—Sir R. Douglas Powell, Bart., M.D., 62, Wimpole Street, W.

Secretaries—Sir Hugh Beevor, Bart., M.D., 17, Wimpole Street, W.; Dr. Hector Mackenzie, 59, Welbeck Street, W.; Dr. R. W. Philip, 45, Charlotte Street, Edinburgh; Dr. William Calwell, 1, College Square North, Belfast.

SECTION III.—PATHOLOGICAL, INCLUDING BACTERIOLOGY.

President—Prof. Sims Woodhead, M.D., 6, Scrope Terrace, Cambridge.

Secretaries—Dr. Wethered, 83, Harley Street, W.; Prof. Rubert Boyce, Liverpool (Univ. Coll.); Dr. E. J. McWeeney, 84, St. Stephen's Green, Dublin; Dr. Perkins, 41, Wimpole Street, London, W.

SECTION IV.—VETERINARY (TUBERCULOSIS IN ANIMALS).

President—Sir George Brown, C.B., Bryn Hyfryd, Harrow.

Secretaries—Prof. Hobday, F.R.C.V.S., 27, Lower Phillimore Place, Kensington, W.; Prof. Bradley, M.R.C.V.S., Royal (Dick's) Veterinary College, Edinburgh; Prof. H. Woodruff, M.R.C.V.S., Royal Veterinary College, Camden Town, N.W.

EXHIBITION—THE MUSEUM OF PATHOLOGY, BACTERIOLOGY, AND PUBLIC HEALTH.

Chairman of Museum Committee—Prof. Sims Woodhead, M.D., F.R.S.E., 6, Scrope Terrace, Cambridge.

Secretary—W. Jobson Horne, M.B., M.R.C.P., 27, New Cavendish Street, Harley Street, W., to whom all correspondence relative to the Museum should be addressed.

RULES AND REGULATIONS.

(1) The Congress shall consist of Honorary Members, Delegates, and Members.

Honorary Members shall be persons nominated by any foreign Government or University, or by the Executive Committee, and shall not pay any subscription whatsoever.

Delegated and Ordinary Members shall be other persons, British, Colonial, or Foreign, who may wish to attend, including representatives from Governments or institutions within the British Empire.

(2) Delegated and Ordinary Members will receive their cards on forwarding the sum of £1 to the Secretary-General of the Congress, 20, Hanover Square, W.

(3) The holder of a ticket of membership is entitled to admission to all the meetings of the Congress, and to receive the *Transactions* and other publications.

Tickets to social gatherings and excursions will be allotted in order of application, or by ballot if necessary.

(4) As the expenses of the Congress will be very considerable, Donations to the Reception Fund are earnestly invited. Donations of more than one guinea will be considered as including Member's subscription, and will entitle the donor to all privileges of Membership. Donations from Corporate Bodies may include the subscriptions of representatives.

(5) The official language of the Congress shall be English, French, and German, and authors of papers are requested to supply beforehand abstracts for translation.

(6) Each Sectional Committee shall draw up its own working programme as to papers to be read, discussions on the subjects proposed, and miscellaneous communications. The various Sections will

meet on Tuesday, Wednesday, Thursday, and Friday, from 9.30 to 1.30.

(7) The speeches delivered at the general assemblies, and the papers read before the Sections, will be published in the record of the proceedings of the Congress; but as regards miscellaneous communications and discussions the discretion in respect of publication will lie entirely in the hands of the *Transactions* Committee and the Presidents of Sections. Each speaker opening a discussion will be limited to thirty minutes' duration, and each subsequent speaker to ten minutes.

(8) An abstract of every paper and communication must be sent to the Secretary-General, 20, Hanover Square, at the latest on or before June 15, 1901.

Translations.

SOME REMARKS CONCERNING BLACKWATER FEVER.*

By Dr. HANS ZIEMANN,

Captain in the German Naval Corps, Physician to the Government of Camaroon.

(Translation by L. EYK.)

GENTLEMEN,—It was not originally my intention to speak on this theme at the present time, only having returned from Africa a few days since. I have not yet had time to consider the question *in extenso*. However, seeing that opinions on this malady are very different, I will give a short account of my own experience, which is especially opposed to that of Drs. Clarais and Robert Koch.

I will first mention that I have never found a specific microbe for this malady as Yersin asserts he has. The clinical picture should be sufficiently known already from excellent descriptions given by many observers. The fact that the malady has been described by some to be purely a quinine poisoning, by others a special form of malaria occurring in certain districts where the affection appears with greater virulence, renders the subject less easily grasped.

If I combine my experience which has been gained from one of the worst blackwater fever centres on the earth with that which can be obtained from literature, I come to the following conclusions:—

(1) In certain virulent malarial centres there exists, among a certain proportion of individuals who have gone through one or more attacks of malaria, a disposition to contract blackwater fever; this tendency exists among the strongest and healthiest individuals. This disposition to blackwater fever is more likely to exist in persons of a family in which a hæmorrhagic diathesis prevails, aggravated no doubt in those who undergo sorrow, deprivations, and great physical exertions.

(2) This disposition seems mostly to exist in persons who have suffered from an infection with the small parasites of the tropics, or of estivo-autumnalis. Koch also observed blackwater fever in persons who had simple tertian; Plehn twice, myself once; Grocco

also noticed it in persons who had quartan fever. In two of R. Koch's cases, however, it is certain that infection through the small parasites also existed, as crescents were found in the blood. Whether in the other cases of Koch's infection through small parasites had previously taken place or not, we will leave undecided. In my cases of simple tertian which were complicated with blackwater fever I should like to emphasize this possibility. Of course I do not mean to say by this that common tertian or quartan under some circumstances do not predispose to blackwater fever.

(3) With regard to the statement that blackwater fever only occurs in a virulent form in certain regions, I should like to call attention to the fact that possibly quite a different virulence of parasites exists, according to the local conditions to which it owes its origin, without necessarily being of a different class. Besides this it must be remembered that in such a dangerous blackwater fever centre as Camaroon, only a few sexual forms, such as crescent, &c., are found. These forms, which occur in Italy very frequently, are mostly only found in cases which are readily curable. As I explained in my other lecture at the Pasteur institution, also in Camaroon the number of parasites in the peripheral circulation is strikingly disproportionate to the importance of the clinical symptoms. In Italy, where blackwater fever is very rare, but where infection through the parasites which are so closely related to those of the tropics is very frequent, I found during my malarial expedition that such a disproportion was much rarer. I should like to strongly advise attention to be given to these important facts in all countries where blackwater fever exists.

On the basis of the tendency discussed above true blackwater fever can only break out through:—

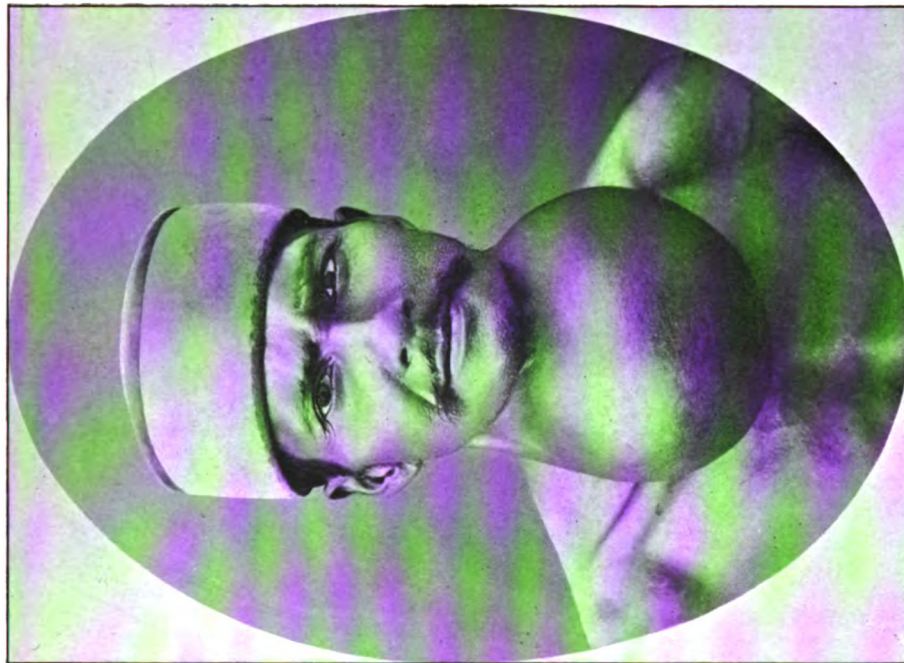
(a) A fresh attack of malaria alone, though quinine has not previously been administered. These cases, as far as they are positively known, appear to be more rare. The breaking out of blackwater fever is favored if at the time the body of the patient has been weakened by cold, &c.

(b) Through a fresh attack of malaria and the administration of quinine at the same time. Such cases greatly preponderate in Camaroon. It appears, as the Brothers Plehn have already found, that in such cases blackwater fever is most likely to break out when quinine is administered, when the fever is at its height. But such cases in my opinion cannot be looked at as simple quinine poisoning, as here two factors, quinine and the malaria, may work together on the patient, who has a tendency to blackwater fever, to produce true blackwater fever.

(c) Through quinine alone, in those who have recovered from malaria, but in whom at the time no parasites are found in the peripheral circulation. These are the cases which Tommaselli has described as quinine intoxication.

(d) Without quinine, in those predisposed to it, who have formerly recovered from malaria, and who have previously recovered from blackwater fever. Such persons can again get this malady though quinine has not previously been given, and though malarial parasites are not to be found in the blood.

* A Lecture given at the International Medical Congress in Paris in the section for Colonial Medicine, August 7, 1900.



FRONT VIEW.



SIDE VIEW.

BRONCHECELE IN A MALAY.

From a photograph sent by Dr. P. G. EDGAR, of Perak. For description see text.

You therefore see I no longer make a difference between the so-called quinine hæmoglobinuria and "febris malarica hæmoglobinurica," as firstly important clinical differences do not exist, and these titles do not appear to me to describe the true character of the malady. I therefore simply speak of febris hæmoglobinurica, and in the above scheme we can place every case of this so frequently fatal malady. The true reason of this mysterious decomposition of the blood we do not yet know. Perhaps we shall acquire more knowledge when we know more of the condition of the parasite forms, which give origin to the malarial relapses (see my other lecture on malaria and mosquitoes on the west shore of Africa.) Blackwater fever also attacks the negroes—Tagos, who have never taken a particle of quinine. On the Congo similar facts have been observed. I saw all transitions from the slightest to the most severe forms. In the slight forms only a beer-brown colouring of the urine, which contained traces of albumen, resulted. A rising of the temperature and a disturbance of the general condition did not take place. *It is these very slight forms which, theoretically, are just as interesting as the severest forms are unfortunately often overlooked.* In the severe cases in which the hæmoglobin which dissolved in serum could be proved, the per cent. in the blood sank, in one case, in two days even 50 per cent. That the recovery from blackwater fever does not always mean the disappearance of the malaria which existed at the same time, a study of the temperature charts will prove. They also show the important fact that by extremely careful proceedings we are able, in spite of extreme idiosyncrasy to quinine, to accustom the organisms gradually to quinine, and in that way to bring the malaria to an end.

In a well studied case, it was proved that when 0.75 gram quinine produced hæmoglobinuria, 0.06 gram quinine produced albuminuria. In predisposed malarial cases, 0.1 to 0.25 gram quinine produces hæmoglobinuria on the west coast of Africa not infrequently.

The absurdity of a promiscuous quinine therapy for such a blackwater fever centre as the coast of New Guinea is self-evident. The Brothers Plehn have already given us light on the subject.

In my opinion the prophylaxis against the blackwater fever will be attained by prophylaxis against malaria.

MALARIA AND MOSQUITOES ON THE WEST COAST OF AFRICA.

By DR. HANS ZIEMANN,

Staff Surgeon, late Government Physician in Camaroon.

(Translated from the German by P. FALCKE.)

REPORT II.

(Concluded from p. 12.)

THERAPEUTICS AND PROPHYLAXIS.

Quinine is, and primarily remains, the sovereign remedy. Phenocoll and methylene blue, the latter of which has been tried as a substitute for quinine,

have, time after time, proved inefficacious. As to the manner of administering quinine during the attack, it may with advantage be stated that it should not be given at the height of the fever, but *if possible* during the intermissions, about five or six hours before an attack is expected. The largest quantity in a day should not exceed 2 grains of quinine.

When the stomach rejects quinine, as when severe vomiting is present, intramuscular injections of the drug have been recommended and used by A. Plehn and myself for years. A note of warning is sounded against the random administration of quinine in scattered, numerous, and small doses *pro die*, without reference to the microscopical condition of the blood. Equally would I warn against the unpractical following of the rule which I have often found on the West Coast of Africa, that quinine is only to be taken when the temperature is 38° C. When it is the question of a first attack of fever the temperature seldom falls to 38° C. at the intermission. From fear of blackwater fever, such patients go for weeks without quinine. The loss of strength goes on and thus certainly a predisposition to blackwater fever is furnished, and even putting that on one side these protracted cases are much more difficult to cure. *In cases in which parasites were to be seen in the most varied stages of development, I have even administered quinine when the temperature was up to 40° C. if intermissions did not set in soon.* Of course, in the case of persons who have been in the tropics a longer time, one has to be more careful of the size of the dose, for then the danger of blackwater fever increases. I have the firmest conviction that quinine influences the asexual parasites in all the stages of their development, only in different degrees, affecting most the youngest extra-globular forms. I still retain my former opinion that quinine only directly touches the protoplasm of the parasite, and secondarily affects the chromatin. *Enquinine is preferable to quinine for persons sensitive to quinine.* Methylene blue as a prophylactic, as recommended by Celli, is from various causes tabooed on the West Coast of Africa. A medicinal prophylactic against malaria in the tropics must, above all, have the property that it be lasting, that it be taken without reluctance, without injuring the appetite, and last, but not least, that it may be used generally and with effect. Thus for the present we have but quinine and enquinine. Six years ago I used quinine in 1 gram. doses prophylactically, with the best possible results, though it was a very bad year for fever (*Centralblatt für Bakteriologie*, 1896, vol. xx., p. 671). Only 23.49 per cent. of the people under my care had first attacks, and only 8.14 per cent. had relapses. Formerly the statistics often showed double or four times these figures. Relapses in particular were very much more frequent; for on the West Coast people fought shy of quinine.

The above proceeding, however, was easier on board ship, where the danger of blackwater fever was practically much less. In such notorious fever regions as Camaroon, where hæmoglobinuria is so frequent, the prophylactic dose of quinine must be smaller. *In other words, the quinine prophylaxis is not one to be used at random, it must be individualised according to the fever-region, but where possible it should be in*

general use, and should be systematically carried through, as was done by A. Plehn in the case of officials who had to take 0.5 gram of quinine every five days. At any rate, the prophylaxis which is to prevent relapses, should, from disciplinary grounds, be the same, which should prevent fresh infection. I found it advisable to order 0.5 gram quinine to be taken every fourth morning fasting, in some tea, so that there were three clear days without quinine. Persons who are already used to the five days' prophylactic should keep to the same. Supposing, however, malaria had been present and quinine had been given on the last day of fever, a few germs might be left which, after twice twenty-four hours, would cause a recurrence. Should quinine then be given after four times twenty-four hours subsequent to the fever, one would just hit upon the easily influenced adolescent forms of the parasite.

This prophylaxis is not a guaranteed protection against malaria, but it ensures a lighter course to the malaria which eventually sets in, and provides a less predisposition to blackwater fever. Personally I remained free from manifest infection notwithstanding the frequency of the possibility of infection. If, in spite of the 0.5 gram quinine (taken on the quinine day) symptoms of latent malaria set in on the following day, I had the doses of quinine repeated on this day and eventually gave 1 gram more. It is of the greatest importance to suppress tropical malaria, once it has broken out, as quickly and energetically as possible. When the parasites have disappeared out of the peripheral blood, I administer 1 gram quinine on three consecutive days, and during the next three weeks 0.5 gram every other day. At the end of that time the patient can return to the ordinary quinine prophylaxis, 0.5 gram every four days.

I can warmly recommend this kind of prophylaxis after recovery from a recent infection. A simple consideration shows that, when the relapses disappear the sexual forms, such as crescents, &c., which are the forms found in relapses, and which by means of mosquitoes convey new infections, also vanish. Five years ago I called attention to the necessity of giving quinine prophylactically when crescents, &c., represented the only conditions of the blood (*Centralblatt für Bakteriologie*, vol. xx., p. 670).

Naturally a general treatment must go hand in hand with such medicinal and individual prophylaxis to guard against fresh infection or relapses. The hygiene of dwellings, of clothing and of food in the tropics must be practised in quite a different degree to what has hitherto been done by private people.

In this respect, from ignorance or indolence, much is left to be desired on the West Coast. To add to this, the number of available mosquito nets is very small. By means of common-sense teaching as to the nature of malaria, the effort must be made to minimise the influence of so-called "old Africans" who, with the best intention, hold forth on their inimical opinion of quinine, and in whom new arrivals blindly believe on account of their African experience. Only a small part of these people believe in malarial parasites. Above all, and for every calling, only the strongest people should be sent out, and twenty-five years should be the minimum age. On all these questions I shall make further

communications. Already the Plehn Brothers, from the wealth of their experience, have protested against the long stay of Europeans on the West Coast. It is a fact that every year many dozens of valuable human lives might be saved by the abolition of the evils mentioned.

In the meantime, in order to provide a prophylaxis as a whole, which would include the great civilised nations of the fever-pregnant parts of Africa, it is absolutely necessary to arrive at a knowledge of the life of malarial parasites outside the human organism. By reason of biological discussions, Mannaberg, with myself, had come to the conclusion that the malarial parasites had a parasitical existence outside man, which must be located in another organism. As relatively few mosquitoes are found in Camaroon, the idea that mosquitoes might be the means would hardly suggest itself. When Ronald Ross's discovery placed the mosquito theory on a solid basis, the necessity of confirmation of the same arose as to:—

- (1) Which insects transfer the infection to man?
- (2) Whether the infected mosquito transmits the infection to its descendants, which on their part again infect human beings, or whether the infected mosquito infects man direct?
- (3) What are the biological conditions of mosquito life?
- (4) Whether, besides man, other hosts for malarial parasites exist?

Remarks on Question No. 1.—It is to be remarked that besides mosquitoes 82 bugs (*Cimex lectularius*) and over 100 sandflies were examined in the dwellings of malarial patients for malarial cocci—all with negative results.

In Camaroon and Cribi I confirmed, first one, subsequently two different anopheles; on the upper part of the Camaroon river I also found one new species, and in Victoria three, of which two were identical with those of Camaroon. Anopheles were confirmed by me in Victoria at a height of 260 metres, and a culex at the height of 1,600 metres. In Togo four different anopheles were found, one of which had unspotted wings.

In Report I. (see December, 1900, issue of this Journal) I mentioned that in the Colony of Camaroon, after great difficulties I succeeded in confirming the transformation of the sexual forms of the tertian and tropical parasites to coccus-like formations in the intestinal tract of the anopheles.

In Togo I had the good fortune to again be able to demonstrate the cycle of development of the tropical parasite in the anopheles. Thus for our German colonies the investigations which Ronald Ross and Koch made on the malaria of birds, and Grassi, Bignami and Bastianelli on the malaria of man are confirmed and thereby the basis for a prophylaxis of greater scope is afforded. My efforts to propagate quartan parasites in anopheles in Togo have hitherto proved unavailable, for the sexual forms could never be confirmed in the blood of the infected negroes.¹

The development of the malarial parasites in the

¹ It was only in Togo that, from a short notice, I gained the knowledge of Ronald Ross' investigations on human malaria in Sierra Leone.

mosquito seemed to take somewhat longer in Camaroon and Togo than stated by Grassi, Bignami and Bastianelli, namely from ten to sixteen days. It is true the corresponding experiments were not made in an incubator at 30° C., but in a darkened room at a temperature of from 25-28° C. It has already been mentioned that the malarial blood at my disposal was very poor in crescents, the number of infected anopheles remarkably small.

In Togo there was a black culex with white tufts on breast and legs and which possibly might be an intermediate host of the malaria germs. The examinations of these could not be concluded. This black culex, with two similar culices, is extant along the entire coast from Togo to the South of Camaroon. The same is very blood-thirsty, and like all anopheles on the West Coast bites at all times of the night and day, though it prefers the night. *This statement is of importance as showing that the infection does not only take place at night, when it is possible to protect oneself by means of mosquito nets against the onslaughts of mosquitoes.* The mosquito fauna, in places quite near to each other, is often quite different. Thus there were amongst mosquitoes from Lome in Togo, some such as did not exist in Small-Popo, only 50 kilometres distant. The question whether anopheles only, or in some places a culex likewise causes the malarial infection, is only of secondary importance for the measures taken for the destruction of culices and anopheles would be about the same. Only as we shall see, the anopheles would be easier to exterminate. Incidentally, also, I discovered anopheles on board steamers 1,000 metres distant from the coast.

Remarks on No. 2.—In reply to this question I refer the reader to Report I. (in December, 1900, issue of this Journal).

Remarks on No. 3.—The biology of mosquito life is covered by the work of Grassi and Celli in Italy, and the question opens up for many localities the prospects of a more vigorous method of destroying these insects. The measures, however, must be vigorous and thorough, for the larvæ of culices preserved in moist soil have been proved to be alive after two days. The culex chooses for the deposit of its ova small puddles of water, very often water barrels, in short, any collection of water. Anopheles generally picks out small, clear, quiet, shady pools containing green algæ. In Camaroon, as also in Togo and Victoria, they were found occasionally in the muddy water of half dried up bogs. I never found the larvæ of anopheles—easily distinguishable from those of the culex on account of their horizontal position in the water—further away from human habitations than 1,000-1,500 metres. Possibly they may be further away where there are pasturages. Lizards were often found in common with them. In Camaroon, at the commencement of the rainy season, anopheles were found more often in way-side puddles or in cans half filled with water, but never in rain-water tubs, and never in the flowing water of a little rivulet which divides the two capitals, Belltown and Aquatown, but again, they were found in stagnant pools by the edge of the rivulet, and above all in the small puddles of the Negro town. Very often in Victoria, anopheles, after the setting in of the rainy season, were found in small ditches by the path

that runs through the so-called Victoria Marsh, as also in small bogs in the valleys, where the ground water appears on the surface; in Togo also in deep wells and furthermore in small pools at the end of the lagoon. Close by the Nightingale Hospital in Small-Popo, they were found in large numbers inside open cemented basins, in the waters of which ducks and geese disported themselves. They therefore seem to be able to adapt themselves to various conditions of life. In Victoria, the larvæ of anopheles died off when I conducted air, by means of a ventilator, into their receptacle for twelve hours. Never were larvæ found either of culex or anopheles in larger sheets of wind-wafted water, as for instance, the Camaroon River or the actual Togo Lagoon. As to the influence of saltiness of water on the development of larvæ see Report I. The introduction of sea water into pools close to the coast might therefore eventually, according to circumstances, be used as a method of destruction. All mosquitoes prefer dark walls to light painted ones as hiding places. *The few data here brought forward show us the way to effectually exterminate our enemy.* The walls of dwellings should be painted light and should contain no dark corners.

All stagnant agglomerations of water near dwellings, as has been found out by the Italians, must be avoided. Water-butts should be provided with closely fitting covers, ground water should be drained away; likewise stagnant surface water by means of open drains, the base of which should be cemented. A descent of the same can mostly be managed. Should the draining away of stagnant water prove too difficult, the pools every ten days must have petroleum poured into them with a watering pot. The layer or film of petroleum need only be a thin one on the surface; I found, as the excellent investigations of the Italians had already proved, that the petroleum furnished a very good and practical means of killing the ova and larvæ. Petroleum is always obtainable in the tropics. For the development from ovum to mosquito, from twenty-two to twenty-four days are necessary. In West Africa the pupa stage only lasts from one to one and a half days. As I experimentally convinced myself, not one single mosquito developed when the above process was followed. *Of course, the pouring of the petroleum into the pool must be done on dry days, so that it is not too much diluted by rain to work effectively on the larvæ.* I found on experiment that the pupæ were more capable of resistance than the larvæ. How easy destruction often is I could instance by many telling examples. For instance, in the cocoa and tobacco plantation of Bibundi, near Victoria, one hour's labour of a negro sufficed to convert a water basin (containing anopheles-larvæ) fed from a spring into a rapid mountain rivulet. *In nearly all the plantations there I have already this spring found ways and means which would partly or completely free them from anopheles.* The intelligent mind of the planter gives hopes that the reforms may be carried out, when possible, under the direction of the doctor. A more general knowledge of the different culices and anopheles, as also of their larvæ, is therefore very desirable. The percentage of morbidity and mortality would soon be favourably influenced. Certainly, it

cannot be denied that the difficulty of drainage for the purpose of exterminating the mosquitoes may be very great. For instance, on the upper part of the Camaroon River, at the mouth of the Dibombe, there are a number of negro settlements, and a few factories belonging to whites. In the immediate vicinity of the same there is an enormous morass covered with thick bushes, in the innumerable puddles of which millions of mosquitoes, amongst which are anopheles, abound. When, towards the end of the rainy season, I stayed there for the purpose of study, the mosquitoes constituted a terrible plague. It would simply be impossible to drain such a morass. In such cases one can but try to raise the general standard of health by means of methodical quinine prophylaxis and the other hygienic factors quoted. *In the tropics, indeed, when building on new localities, it should be the tropical hygienic doctor and not the architect who should be consulted. Above all, the settlements of the negroes should be at least 1,200 metres distant from the dwellings of the whites, for, in the first instance, they supply the conditions for the spread of malaria.*

I have the strongest feeling against the use of incense, inunction with ætherised oils, &c., in order to keep the mosquitoes at a distance. In theory these methods are very nice. In West Africa they will never be accepted. The anointing of the skin with oils would be impracticable, for the simple reason that in the damp-warm climate the European skin becomes exceedingly sensitive.

A second mode of general sanitation of the tropics *theoretically*, would be to submit the entire population, black and white, to a universal strict quinine prophylaxis. *Theoretically*, by these means, the formation of the sexual parasitic forms could no more take place. The malarial germs could not vegetate further in the mosquitoes, in short, malaria would die out. Such a proceeding would be considered justifiable in settled, more highly civilised natives of fever regions, but could never be compassed as regards the more or less floating population of West Africa. Thus, the superstitious mind of our negroes, who have more faith in the faculty and unearthy yellings of their wise men and women than in the medicines of the most learned white doctors, would never submit to any prophylaxis of their own free will. The Dualla are pedlars and wander through the land, men as also boys, in hundreds. Even if their malarial infection in Camaroon could be cured by quinine, the possibility of new infections exist nearly everywhere. In the African primæval forests there is neither doctor nor magistrate who could distribute quinine. Were the little children the only carriers of the infection the practical difficulties would be less. However, as we have seen, such is not the case. Even the mountain folk, the Bakweris by Victoria, are more or less migratory. It would be easier to carry out the prophylaxis of the natives in Togo on the Ewe-negroes. But even with these, who are employed in hundreds along the whole malaria-drenched coast of West Africa as workmen or labourers and are continually exposed to new infection, there is a constant coming and going. The Haussas, too, who come from the unknown interior, also constantly

carry in new malarial germs. *What, however, is a crying need, and would, besides, be practicable, is that all white Officials of the State should by contract be forced from the commencement to take quinine prophylactically, and each man should take quinine in Europe before starting, to prove that there is no idiosyncrasy against it. He who cannot stand it should stay in Europe. Hardly any one now journeys to West Africa on pleasure, and the man who goes there on business in a sense no longer belongs to himself but to his employer. The State, like the private employer, may therefore also demand that its officials should maintain their health by following the necessary orders. Fortunately the number of white persons willing to undergo the prophylactic treatment is increasing on the West Coast. It would also be practicable for white householders to introduce and systematically administer quinine to their black indoor servants and to their work-people. In this connection I more particularly refer to the labourers on plantations. These, unfortunately, are generally lodged near the dwellings of the whites. Thorough and systematic administration of quinine to the actual natives would, I fear, be a matter of difficulty. Therefore, as already mentioned, they should not, as in Camaroon, dwell in the immediate vicinity of the whites.*

An enemy should be beaten not at one but at every point. Thus, the malarial germs can only be combated by the combined measures here briefly sketched, and with a strict regard to the local, often varying, conditions. There can be no general scheme.

Remarks on No. 4.—In regard to a few investigations as to whether, besides man, animals may eventually prove the intermediate hosts of malarial parasites, see Report I. The investigations were also interesting from the purely parasitological point of view. As in the case of proteozoma, halteridium, in a great number of birds examined, were less numerous than in Italy and the East Indies. Drepanidia, likewise, were more rare with us in frogs and lizards, but on the other hand, more numerous in snakes. *My former doubts of the statements that the drepanidia were quite distinct from the cycle of development of the parasites of the blood corpuscles have received fresh confirmation.* Incidentally while making blood examinations from animals in Togo, in June, 1899, I discovered a disease in a dog, which was similar, if not identical, with tsetse, being caused by trypanosoma; it had a rapid, fatally terminating course, and was transferable to goats. I likewise discovered a horse disease, which seems identical with the dourine of horses described by Nocard in Algiers. Oxen and goats never exhibited parasites of the blood corpuscles. *The infection of a dog and long-tailed monkey with parasites resembling the tropical parasite has been described elsewhere (Report I.).* I was the first to confirm this infection in the monkeys. I was prevented from undertaking immunising experiments against tropical fever with the serum of bats and monkeys, which exhibited tropical like parasites on account of the scarcity of animal material. I could not accomplish an infection with tropical parasites on two long-tailed monkeys and two bats. At last I succeeded in again discovering the pigmented parasite in a chimpanzee from the French Congo, which Koch

first discovered in the East African ape. In this case also no segmentary forms could be found. *Possibly, therefore, man may be regarded as the sole intermediate host of malarial parasites.*

In this article I think I have covered the principal tropical-hygienic points of view which come into the question for the beautiful German colonies, Camaroon and Togo.

I trust they may soon have good and favourable results.

It will be of value even if the discovery should be made that the bite of the infected mosquito does not represent the only method of infection.

In conclusion, I must tender my thanks to Governor v. Puttkamer and Governor Köhler, for their important assistance and support in my work.

British Medical Association.

ABSCCESS OF THE LEFT LOBE OF THE LIVER, WITH PARTICULAR REFERENCE TO ITS AMOEBC CAUSATION.

By Staff-Surgeon P. W. BASSETT-SMITH, R.N.

Lecturer on Tropical Diseases, and Bacteriologist, Haslar Hospital.

(Continued from p. 16.)

ALL cases of abscess of the liver are of great interest, owing to the diversity of opinions held with regard to their causation, the difficulties of diagnosis often present, and the great variety of symptoms during the course.

Of late years the theory that many of these abscesses are directly due to the presence and products of the *amœba coli* so ably advocated by Kartulis and Lafleur, has been gaining ground. Any cases, therefore, which have a direct bearing on this are of importance. I have accordingly ventured to bring before the Association a case which has lately been under my treatment, and which seems to me to point strongly to the validity of this theory. The case is the more interesting as occurring in England, in a man who had not been abroad for two years, and also that systematic and scientific observations were carried out in the new and well-equipped laboratory attached to the Royal Naval Hospital, Haslar. In this case the hepatic abscess followed quickly after an attack of dysentery; *amœbæ* were abundantly found in the abscess fluid to the complete exclusion of pyogenic bacteria. After death recent shallow (probably *amœbic*) ulcers were found in the cæcum.

Three chief views are held as to the pathogenic action of the *amœba coli*.

(1) That of Kartulis, who believes that they play a principal part, by their active movements causing rupture of the capillaries, &c., but that they also act as carriers of bacteria which cause the suppuration of the liver.

(2) That of Kruse and Pasquale, who think that none of the bacteria are sufficiently constantly found to be considered specific, but that with some of these pyogenic organisms the *amœbæ* assist in the disintegration of the liver substance.

(3) That of Councilman and Lafleur, who consider the *amœba coli* alone as active agents in the production of these abscesses, which view is strongly favoured by the character of the local lesions and the frequent absence of any pyogenic organisms, even when carefully looked for.

The subject of the present case was a petty officer in Her Majesty's Navy, of robust constitution and healthy habits. He had not been further than the Mediterranean for a long time, having been back over two years. He had not out there suffered from malaria or dysentery. In November, 1899, when at his own home in Portsmouth, he had an

attack of semi-acute dysentery, lasting a month. In December he was feverish and was said to have influenza; having some lung symptoms he was in January sent into Haslar Hospital. After admission he had high fever with marked rigors; a diagnosis of malaria was made. In February he was transferred to the ward for tropical diseases. There I utterly failed to find any evidence of malarial infection, but a leucocytosis with an increase of fibrin threads in the blood was very marked. From this I gathered that there was an acute inflammatory condition going on. Serum diagnosis observations for Malta fever and typhoid gave negative results. No tubercle were present in the scanty sputum.

With the history of recent dysentery the probability of hepatic abscess was evident; but though constitutional symptoms were very marked, rigors, irregular fever, profuse sweats, and increasing *anæmia*, yet there were absolutely no liver symptoms, this organ appearing smaller than normal. A consultation was held, operative measures being deferred. The condition did not improve, a short irritating cough came on, the sputa being scanty and mucoid. Finding some impaired resonance at the left base I explored there with negative results. The next day he was placed under an *anæsthetic*, and though no signs of hepatic enlargement were present, the right lobe was carefully explored with a large needle, three punctures being made from the side and three from the back. No pus was, however, found. The signs of septic poisoning continued, the rigors being less marked, but the cough more troublesome, the sputa still remaining scanty, mucoid, and free from tubercle. Diaphragmatic pleurisy was undoubtedly present; later a localised pain was felt in the right hypochondrium. I again explored without result. Signs now of cardiac disease became apparent, fleeting *bruits*, diffused and displaced impulse, with fast and soft pulse.

A bacteriological examination of the blood from the finger tip was made, but in spite of great care an impure culture of *staphylococcus epidermidis albus*, and *sarcina rubra* was only obtained. The rigors were now very intense, the temperature rising to 106°-108°. He, however, continued to eat well in the apyrexial periods. *Antistreptococcus* injections were given, but they did not reduce the fever. Muttering delirium came on at night, and he appeared losing power rapidly. On April 13 I noticed his legs drawn up, and found some fulness in the left hypochondriac region. It was immediately explored, a little reddish pus being drawn off from which an agar tube was inoculated. The next morning he was *anæsthetised*, the part opened by Fleet Surgeon Gimlette, R.N., through the adhesions, a quantity of red curdy fluid escaping. His temperature fell considerably after the operation, but he only lived three days. On the day of his death *amœbæ* were abundantly found in the discharge, but no pyogenic organisms were obtained, either from the first pus drawn off, or from that at the time of the operation, though cultures were made in broth, on agar, and on blood serum. The *post-mortem* examination showed firm adhesions of the liver at the seat of the incision, but none elsewhere. The liver was enlarged, weighing 70 ozs., the left half was deeply congested, the left lobe was very slightly enlarged, though entirely excavated by the abscess, the walls being in a shreddy, grey, necrotic condition. There was no secondary abscess of the liver. The left lung was healthy, the right was attached by adhesions to the diaphragm but could be easily peeled off, showing no loss of continuity there; the lower lobe was firm, having in the centre a large ragged grey, abscess cavity, very like that in the liver. There was marked recent pericarditis, the surface being coated with rough lymph. The valves and endocardium were healthy. The whole of the cæcum showed evidence of recent ulceration; these ulcers were oval with thickened edges, having for their floor the submucosa. The surrounding mucous membrane was congested, but there was no marked thickening of the gut. A few ulcers were also found in the ascending colon.

Cases of abscess of the left lobe of the liver are rare, they

are also difficult to diagnose. Here the evidence of an inflammatory process was early marked, the hepatic origin being strongly suspected: but the absence of enlargement, local pain, and the negative results of exploratory punctures were all very puzzling. The diaphragmatic implication pointed to the abscess being in the upper and back part, the position where these abscesses are so commonly found. When cardiac symptoms became marked a septic endocarditis was suspected.

The points of special interest I think are:—

(1) The occurrence of dysentery in England years after leaving a foreign station.

(2) The position of the abscess in the left lobe.

(3) The abscess in the right lung which did not directly communicate with that of the liver.

The infection of the lung through the serous membrane without perforation is important. It is stated by Lafleur to occur but rarely. A certain amount of aerated tissue surrounded it, hence causing the masked pulmonary physical signs. The cutting off of this necrotic portion of the lung tissue by blocking of the surrounding bronchi is proved by the entire absence of any purulent expectoration, which was carefully looked for throughout.

Considering the length of the case and the great destruction of lung tissue, the absence of any such evidence was very unusual, emphasising the fact stated by Lafleur, that the physical signs of hepato-pulmonary abscess are even more indefinite than those of a deep-seated hepatic one, often remaining so for a longer time. He says "that it is surprising after death to find extensive lesions of lung and liver where physical examinations and exploratory aspirations had afforded but inconclusive evidence of suppurations of these organs."

(4) The pericarditis.

(5) The presence of *amœba coli* in the abscess fluid two days after the operation, and the sterile condition of this pus.

It is difficult to understand how, with an absence of pyogenic bacteria, such excessive clinical evidence of septic infection is to be explained, and in what way did the secondary abscess of the lung and the pericarditis originate.

It seems probable that the dysentery was directly due to the *amœba coli*, that these were conveyed to the liver, setting up the necrotic change there, and from there passing through the serous membrane to the lung, and that these *amœbae* are able to secrete some toxin able to produce intense rigors, &c. The secretion from the lung tissue was not examined for *amœbae*, the *post-mortem* examination being made too long a time after death.

In cases of this kind the diagnosis has to be made by a process of exclusion. Liver abscess was recognised, but the position in the left lobe was not suspected. It was not until quite late in the case that there were any symptoms pointing to this, indicating the necessity of frequent and systematic exploration of the whole organ.

Dr. MANSON stated that under ordinary circumstances there was great difficulty in many cases in diagnosis of pus in the liver by needle punctures, but when the abscess had opened into the lung and the pus was being expectorated, the difficulties in the way of finding the seat of the liver abscess by puncture with the needle of an aspirator was increased manifold. Fluid resembling liver pus he had known to be drawn off by the aspirator, and yet the pus had been coughed up afterwards. He regarded the operation practised by most British surgeons as altogether too heroic. Unless the thorax were involved it is not necessary, nor is it good surgery, to treat a liver abscess as one would an empyema. He had relied upon the trocar and cannula in the treatment of pus confined to the liver, and he had seen it used with excellent results by others. He had not met with the *amœba coli* in the sputum of patients suffering from abscess confined to the liver. Dr. Manson regarded leucocytosis not as an evidence of malarial infection when it is met with in liver abscess cases, but merely as an indication of an inflammatory process. Dr. Manson was at a loss to under-

stand the serious hæmorrhage that had occurred in Bombay from puncture of the liver by the needle of an aspirator.

Major RONALD ROSS mentioned a case of hepatic abscess he had seen in Liverpool, in which leucocythæmia, but no evidence of malaria, was present.

Mr. CANTLIE said he had followed Dr. Manson's plan of treating liver abscesses by the trocar and cannula and the subsequent insertion of a large drainage-tube into the cavity with success. He had also seen it used many times by Turnbull, Cowie and Stedman with conspicuous success in Hong-kong. Mr. Cantlie urged the use of the trocar and cannula as a method of treatment, as it could be used with safety and at an early stage of the disease. In out-of-the-way parts of the world it frequently occurred that the surgeon can have no skilled help, and under the circumstances to reach by a laparotomy, or a transthoracic path, the pus in the liver, is an undertaking that is apt to be deferred or put off altogether until it is too late. No surgeon would, however, hesitate to first put the needle of an aspirator into the liver, and having found pus, to thrust a large trocar and cannula along the track of the needle towards the seat of the abscess. Mr. Cantlie believes that with this instrument in the hands of a practitioner in the tropics, especially when no skilled assistance is obtainable, early search would be made for the pus, and many lives saved. He regarded the formation of an abscess in the lung or pleura subsequent to a liver abscess as a sign that the medical practitioner had delayed operation too long; it is a sequel to liver abscess which he would not say should never be allowed to occur, but it was one which, as the adoption of the use of the trocar and cannula came to be general, would be quite exceptional.

Colonel KENNETH MACLEOD said: I quite agree with Dr. Manson's remark on the subject of heroic surgery in cases of liver abscess. I also consider that in the great majority of cases resection of rib is unnecessary, or stitching of the edges of serous membranes. In lung cases in which filling of the pleural cavity or destructive abscess of lung has arisen as a secondary event, resection of rib is advisable. I may mention that in one case I derived assistance in diagnosis from the intercostal impulse caused by gentle coughing. This physical sign might be useful in many diseased conditions of lung and pleura.

THE CYPRUS SPHALANGI AND ITS CONNECTION WITH ANTHRAX.

(CALLED LOCALLY "SPHALANGI BITE.")

By GEORGE A. WILLIAMSON, M.B., C.M. Aberd., Cyprus.

The so-called sphalangi of Cyprus is an insect, in general appearance resembling an ant of medium size. The body is divided into three segments, the head and the thorax being dull red in colour, and each about half the size of the abdomen, which latter is black, marked with spots or bands (amalgamated spots) of yellow. The abdominal segment in some carries at its extremity an elongated process, the "sting." Others do not have this process. The sting-bearers are apparently the females, the sting being a modified ovipositor. Those without stings are males. The length of the insect is one-third to one-half an inch, and the whole body is covered with fine hairs, visible under a magnifying glass. These hairs appear important, as they may carry infective material, for example anthrax spores, to an abraded surface. In early summer winged individuals are met with. All seem to lead a semi-subterranean existence and to be omnivorous, with, if anything, a preference for foul material. The sphalangi is met with only during the hot weather, from June to November.

IDENTIFICATION, &c., OF THE SPHALANGI.

Professor Truill, of Aberdeen University, to whom I sent a few specimens for identification, kindly sent me the following account:—

"(1) The insects all belong to a genus of *Aculecti* (sting-bearing) hymenoptera, called *Mutille*. About 1,000 species have been distinguished, often by very slight characters, so that it is scarcely possible to determine the species except by comparison of good series with accurately named collections. There are not more than perhaps five or six specialists in Europe that could do so with certainty. The species are scattered over the world, especially in warm countries, and there are probably a good many species in Cyprus. I think there are three species represented in your tube—namely, the large one with sting hidden, the small one with sting out, being distinct; and the other two probably belonging to one species, despite difference in size.

"(2) Life histories alike in all species of *Mutille* so far as is known. Thus the specific names are of little importance from your point of view, except for completeness, and that would require an accurate and detailed study of the genus in Cyprus. All species whose life-history is accurately known live as larvæ—their metamorphosis being complete—in the cells of the true bees—some in those of honey bees, others in those of the very numerous kinds of solitary bees—eating the food prepared by the bees for their own larvæ. When fully fed they become pupæ in the cells, and the perfect insects emerge from the nests of the social bees or the burrows of the solitary species.

"(3) The females are always wingless. The males are winged of all except a few species. I think those sent by you are all females, the sting being pushed out in two and retracted in the other two.

"(4) The females can and do sting in self defence."

BELIEF AS TO EFFECTS OF "SPHALANGI BITE."

It is firmly believed throughout the island that the sphalangi can sting or "bite" (as the literal translation of the Greek word makes it), and that the effects are generally serious and may be fatal; many cases are on record, and deformities as the results of the sting, are frequently met with. I was unable to accept the story that the sting of itself could cause such terrible results, and subsequent experience of cases has led me to what seems to be the correct explanation of the injuries caused by the sting.

EXISTENCE OF ANTHRAX.

Before going further I should like to point out that the disease known in the island as "phylangari" (φλαγγάρι) in sheep is really anthrax. This I have no hesitation in stating, having examined the blood of animals suffering from phylangari, and finding it crowded with unmistakable anthrax bacilli. I have also found the disease in horses, two cases, both fatal. Unfortunately, the carcasses of animals dying of phylangari are too often left to lie where the animal died, the skin being removed.

(To be continued.)

attributed to malaria; enteritis, hepatitis, splenitis, cystitis, nephritis, urethritis, nervous affections, and finally, malarial chancre. He asserts that the action of quinine is not steadfast in so-called malarial fevers. He touches on the bilious forms of malaria, such as *vomito negro*, the algide forms of cholera, the hyper-febrile accesses of typhoid fever, heat strokes, and the comatose forms of uræmia.

Part II. is largely devoted to the study of the action of quinine and to intermittent fever in Algeria, which he considers to be a benign affection. At the commencement of the fever he does not employ quinine. A dose of quinine given at the commencement of an access of fever, has no influence on the latter, but induces a subsequent febrile condition, lasting five days. The dose should be 0.25 grams for quartan, 2.50 gram for quotidian, and 2 grams for tertian fever. The author, from his own experience, is of opinion that the intra-cellular parasites are due to alterations of the protoplasm, the sporozoites are nothing but particles of diseased corpuscles, the crescents are but red blood corpuscles, of which part has been expelled; the melaniferous pigment is only to be met with in inebriates, and are not pathogenic, and more to the same effect.

Part III. deals with those forms of so-called malaria uninfluenced by quinine. According to this author these comprise: (1) the remittent fever of bacillus coli, and the entero-colitis of the tropics (in Dr. Legrain's opinion these are ameliorated by the use of betel and salol); (2) the group of medical septicæmias; (3) Mediterranean or Malta fever, which is quite distinct from either typhoid fever or malaria; (4) illnesses of the type of "vomito negro"; (5) those various ailments attributable to alcoholism, syphilis, and tuberculosis; and (6) cachexias due respectively to the abuse of alcohol, disorders of the blood such as leucæmia, anæmia, pernicious anæmia, and disorders of nutrition.

Dr. Legrain has come to the conclusion that paludism is a myth, a proteus-like illness representing only a small part of the disorder due to tropical climate. It is only more minute study of these diseases which will lead to more efficacious and rational treatment. Sulphate of quinine should disappear from the medicine chest of colonial practitioners.

Reviews.

LA PESTE ET SON MICROBE (Plague and its Microbe), par Professor Netter (Paris), Georges Carré, et C. Naud. Paris, 1900.—This publication is thoroughly up to date, and conveys valuable information concerning the modern pandemic of plague. The illustrations are well done, the maps show the localities affected by plague, and the effects of vaccination are carefully recorded.

INTRODUCTION TO THE STUDY OF FEVERS OF WARM COUNTRIES, by Dr. Emile Legrain. Paris, 1900.—Part I. In his introduction the author summarises the disorders which—justly or unjustly—are generally

Current Literature.

ABSCESS OF LIVER.

Two cases recorded in the Report of the Principal Medical Officer of Hongkong for 1899:—

Case 1. *Abscess of Liver; Operation; Recovery.*—An English officer in the mercantile marine, aged 39, was admitted to hospital on February 7.

Previous history.—He had had an attack of dysentery in 1881. Last March was laid up with an attack of malarial fever on the West Coast of Africa and had two relapses whilst in England.

Present history.—For the last five or six months has been troubled with pain in the region of the liver, which four days ago became much more severe and was accompanied by pain in the right shoulder. Liver dulness is increased with distinct tenderness in lower intercostal spaces on right side. Breath very short. Temperature 100.8° on the 9th. Under chloroform an aspirating needle has proved the presence of pus; an incision was made in the ninth interspace and a drainage tube inserted. The temperature at once came down to normal and remained so up to twenty-fifth day, when there was a slight rise (100°) owing to a small accumulation of pus in the rapidly closing sinus. This was evacuated, and the patient was discharged quite cured on the thirty-sixth day, having gained 8 lbs. in a week.

Case 2. Abscess of Liver. Removal of large gall stone. Recovery.—Ng Wan, Chinese lukong, aged 38, was admitted on May 30. He had been ill with fever four days. The liver dulness was increased two fingers' breadth below the cartilages, and was very tender especially over the seat of the gall bladder. There was dulness in the right chest posteriorly, with feeble sounds. He had never had dysentery. The temperature varied from 99° in the morning to 104° in the evening.

On June 6 the liver was explored and pus found, and next day under an anæsthetic an incision was made below costal cartilage of seventh rib in nipple line, and a tube was inserted into an abscess, and two pints of pus evacuated. The temperature dropped at once and kept normal. On August 16, as there was still a discharging sinus, the patient was put under chloroform again, and the sinus scraped. A calculus was felt and part removed. On August 21 he was again operated on, and after some trouble a calculus was removed in pieces weighing 420 grains. The patient rapidly improved in weight from 114 to 127 lbs., and general health, and was discharged on September 16 with the sinus quite healed, and the liver dulness normal. Throughout the case there was no jaundice or any bile discharged through the sinus.

News and Notes.

MAXIMILIAN FRANK SIMON, M.D., on retirement as Principal Civil Medical Officer of the Straits Settlements, has been gazetted a C.M.G. We congratulate Dr. Simon upon the well-deserved honour bestowed upon him. Dr. Simon's name stands high as an authority on tropical diseases, and his administrative ability has procured for him many encomiums. We hope Dr. Simon will continue to take an active interest in the branch of medicine he has so long and so successfully devoted himself to, and that many years of useful work may be his. The Editors have been frequently indebted to Dr. Simon for several excellent contributions, and they can assure him that the readers of the JOURNAL appreciate highly any article emanating from so reliable a source.

EXCHANGES.

Annali di Medicina Navale.
Archiv. für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Medec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Exercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
Pacific Medical Journal.
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- 2.—Manuscripts sent in cannot be returned.
- 3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.
- 4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.
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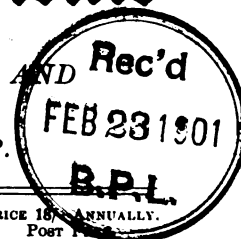
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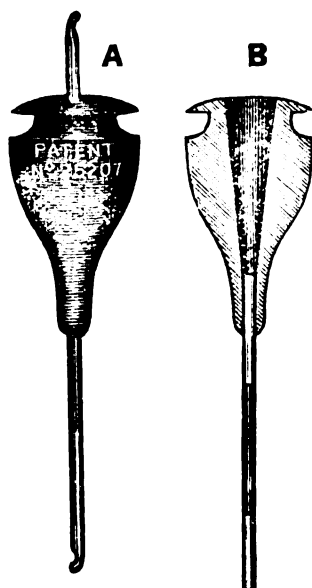
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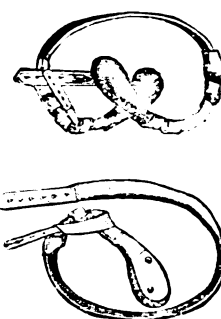
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The Journal of Tropical Medicine.

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Original Communications.

OBSERVATIONS ON MALARIA AND MOSQUITOES IN QUEENSLAND AND BRITISH NEW GUINEA.

By SIR FRANCIS P. WINTER, C.M.G.
Chief Judicial Officer, British New Guinea.

I VENTURE to address you on a subject which probably I am not competent to write about, namely, mosquitoes and malarial fever. I possess no scientific knowledge either of mosquitoes or of malarial fever, but having resided many years in Queensland and in New Guinea, I have made the acquaintance of both of these afflictions.

Judging by the tenor of some of the articles on the above subject that have appeared in your journal, it would seem that the writers thereof had obtained much of their knowledge from the conditions existing in tropical localities in which shallow pools and marshes were numerous. Such a country is, as a rule, congenial both to mosquitoes and to malaria. Hence to my unscientific mind this kind of country does not seem to be the most suitable one in which to seek facts that will countenance or discountenance the theory that the malarial parasite is introduced into the human body solely by the direct or indirect medium of the mosquito. Researches in a country in which malarial fever is common, but in which mosquitoes are unknown, or at least are very uncommon, would, it seems to me, be more likely to lead to conclusive proofs, one way or the other, than researches in a country that is a congenial home of the mosquito and of malaria. To show that there may be such countries I give some of my own experiences.

Some twenty years ago I lived in the little township of Clermont on the Peak Downs in Queensland, the latitude of which is about 23 degrees south, and the longitude about 148 degrees east. Compared with the coast country, these downs form a plateau some 800 feet above sea level. In summer it is very hot there in the day time, but fairly cool at night. In winter it is warm in the day time, but the nights are cold, the thermometer often falling below freezing point. To the best of my recollection I never felt or saw a mosquito during the two and a half years that I was at Clermont, nor ever heard of any one else doing so, although I was told that in summer they sometimes made their appearance at Copperfield, a small settlement distant from Clermont some four miles. I visited other places on the Peak Downs, but so far as I can remember I never came across mosquitoes at any of them. We slept under mosquito nets at night, even in mid-winter, but not with the view of keeping off mosquitoes. I camped out with a large party from the township for two nights alongside a chain of pools, in the middle of summer. No one brought a mosquito net and no one was troubled by mosquitoes.

Malarial fever was common at Clermont, and all over the Peak Downs. Attacks usually took place in the latter part of autumn, in winter, and in the early part of spring. It was seldom that any one suffered from fever in the summer time. I had two slight attacks, the first attacks of malarial fever I ever had. Whilst I was at Clermont what might almost be termed a natural phenomenon was coincident with an outbreak of malarial fever. One morning in autumn or winter, I forget which, an odour resembling the stench from a foul drain or a water-closet pervaded the whole place. It was caused by an exhalation

from "gidiya" trees growing in a scrub half a mile away. This was my sole experience of this peculiarity of the gidiya tree. The odour disappeared in a few hours. On the day in question no one was suffering from malarial fever in Clermont, but on the following day quite a number of the town's people had attacks of it.

The Peak Downs, as a whole, is a dry district; the rainfall is scanty as a rule, and much of the soil is porous. As regards Clermont, a long narrow, rather shallow pool, which always had water in it, ran through the town. Some persons drank the water of this pool, but most people drank water obtained from iron tanks, filled by rain or from wells.

It seems to me that medical men living on the Peak Downs, or in dry districts in Queensland, where malarial fever is common, might be able to furnish valuable information on the question, of whether malarial fever is due solely to mosquitoes.

I cannot say that my New Guinea experience throws much light on the subject of the introduction of the malarial parasite into the human body by the agency of the mosquito, but it certainly proves that mosquito bites are not in all cases soon followed by malarial fever, even in a country in which the parasite must be very common. I was not attacked by malarial fever until after I had been a year and eight months in the country. A few months after I arrived in the country, mosquitoes were for a good while very numerous and bloodthirsty, and I was frequently bitten in the day-time and in the night time. I think it most probable that during this year and eight months, most of which I passed at Port Moresby, I often drank water in which mosquitoes bred. The water supply of the settlement is rain water collected in rain tanks, and mosquitoes breed in these tanks.

The ratio of malarial fever in different localities in New Guinea bears no proportion to the ratio of mosquitoes in these localities. In some districts where malarial fever is common mosquitoes are not. But as probably all Europeans who reside in these last named districts have, in order to get to them, passed through localities in which the mosquito abounds, and none of these Europeans have been long in these districts, one cannot draw any satisfactory conclusions from attacks of fever within these districts.

To go back to the question of experiments carried out in localities that are congenial to the malarial parasite and to the mosquito. If the mosquito hypothesis is left out, I presume it will be granted that the more abundant and vigorous the parasite is in a given district, the more likely is it to find its way through some channel or other into the bodies of the people that dwell in that district. I also presume that it will be admitted that the more mosquitoes abound in any given district, the more likely are the people that live in such district to be bitten by mosquitoes, or to eat food, or to drink water that has been infected by the mosquito. Therefore the more the mosquito and the parasite abound in a district, the more difficult must it be to prove that the mosquito is the only medium through which the parasite gets into the human body. If the experiments can be made on a human being originally free from the parasite, after he has lived for some

time in a district congenial to the mosquito and the parasite under conditions which precluded the possibility of any connection between him and the mosquito, then such a district may be the best place to experiment in. But I must confess that I regard the attainment of this possibility in a mosquito infested country as very difficult.

I will conclude by giving an instance of how one may be bitten by mosquitoes without being aware of it, and under conditions that apparently rendered it impossible for a mosquito to bite one. I have gone to sleep in a bed, protected by a mosquito net. There were no mosquitoes within the net, and no orifice through which they could get inside it. Whilst asleep I have stretched out my arm, and thus brought my hand in contact with the net. The mosquitoes outside the net thereupon bit my hand through the net. I have several times been awakened by the smart of the bites inflicted in this way. Given a sound sleeper or a person not much irritated by mosquito bites, or bites that produce little irritation, and the bitten slumberer on waking in the morning would not know that he had been bitten, and probably would be prepared to assert that he could not possibly have been bitten.

MOSQUITOES AND MALARIAL PARASITES IN HONG KONG.

By JOHN C. THOMSON, M.D., M.A., and T. M. YOUNG, M.B.

THE following Report on the Prevalence of Malarial Fever at Tai Po,* New Territory, is published by command of the Hong Kong Government. Nov., 1900.

Drs. Thomson and Young state that before commencing their investigation the following statistics as to the prevalence of mosquitoes at Tai Po during September, October and part of November, had been placed at their disposal.

Date.	Mosquitoes Caught.		Anopheles.		Culex.	
September 4	..	50	..	1	..	49
" 19	..	11	..	4	..	7
" 24	..	62	..	23	..	39
October 4	..	50	..	5	..	45
" 17	..	37	..	33	..	4
" 21	..	44	..	27	..	17
November 12	..	55	..	33	..	22
Total	..	309	..	126	..	183

i.e., Anopheles, 40 per cent.; Culex, 60 per cent.

By special request there had been no selection of specimens, all those caught on the various dates named being sent for examination and classification; so that during the period between September 4 and the date of our visit 40 per cent. may be taken as the actual average prevalence of the *Anopheles* among all mosquitoes found. The species is a larger one than that most common in Hong Kong, and we identify it as *Anopheles sinensis*.

From police records placed at our disposal we ascertained that the cases of fever among the police during the last twelve months have been as follows:—

* Tai Po is in the New Territory recently acquired by the British Government on the Chinese mainland opposite the island of Hong Kong.—Ed. Jour. Trop. Med.

	No. of Cases.	Average Police Strength.
November (half), 1899 ..	5 ..	2 Europeans, 7 Indians
December, 1899 ..	2 ..	" "
January, 1900 ..	1 ..	" "
February ..	2 ..	" "
March ..	2 ..	" "
April ..	0 ..	" "
May ..	2 ..	" "
June ..	5 ..	" "
July ..	13 ..	3 Europeans, 22 Indians
August ..	27 ..	" "
September ..	28 ..	" "
October ..	17 ..	" "
November (half), 1900 ..	1 ..	1 European, 14 Indians

It is noteworthy, on comparison of this with the preceding table, that while the enumeration of *Anopheles* rises to 60 per cent. of all mosquitoes found at the date of our arrival at Tai Po, malarial fever had almost disappeared. We attribute this rapid fall in the number of cases of fever during the period of the cutting of the second rice-crop, which we found in progress, and during which the previous experience of the police would have led to the expectation of an increased number of cases of malaria, chiefly to the recent adoption of vigorous prophylactic medication with quinine on two days successively at intervals of seven days.

We made careful search in all directions around the Government buildings and matsheds for breeding-places of *Anopheles*, our investigation extending over the adjoining paddy-fields as far as the river to the north, to the villages on the west, and across the river and up certain of the ravines beyond it on the south side.

We show the results of our search on the accompanying rough sketch-map,* the places where *Anopheles* larvæ were found being indicated with red ink. We believe that the negative results in the paddy-fields and in the whole river valley to the south were probably chiefly due to the washing away of larvæ by the rain-storm which accompanied the typhoon three days before our visit. The positions in which larvæ were actually found abundantly were in the narrow ditches around the uppermost paddy-fields, where the rain-washing would be least marked, and in a marshy sluggish stream, into which the paddy-fields drain, to the north-west of the Government buildings, where also the disturbance by the storm would be at a minimum.

We direct special attention to two important points:—(1) That the breeding-pools that proved most resistant to the severe strain of the recent rain-storm, and which even at this late date in the year contain abundant larvæ, are within eighty yards from the Police Station and forty yards from the matshed occupied by the Civil Staff; and (2) that the marshy stream above referred to is a permanent and prolific breeding-ground.

We examined under the microscope the blood of ten children from the village nearest to the Police Station. At first we had some difficulty in obtaining the necessary specimens, but having finally persuaded a chair-coolie to bring his own son we presented the child with a five-cent piece, and let it be known that we were willing to pay for blood at the rate of five cents per drop, whereupon more children turned

up than our time permitted us to deal with. Results were as follows:—

Sex.	Age.	Type of Parasite Found.
Male ..	3 ..	Benign Tertian Gamete.
Female ..	8 ..	Benign Tertian Rosette.
Male ..	14 ..	Nil.
Male ..	9 ..	Nil.
Male ..	3 ..	Aestivo-Autumnal Gamete.
Male ..	15 ..	Nil.
Female ..	5 ..	Young Aestivo-Autumnal.
Male ..	14 ..	Young Aestivo-Autumnal.
Male ..	9 ..	Nil.
Male ..	8 ..	Nil.

Thus in 50 per cent. of the cases examined we found the parasites of malaria; and when it is borne in mind that the amount of blood examined in any case did not exceed the size of a pin's head, and that in no case did time allow us to take a second specimen, it will be apparent that the actual prevalence of malaria among the village children is probably greater than the percentage above named. Two cases were of benign type and three malignant, and while all five children were infective to the mosquito, rendering any *Anopheles* feeding upon them capable of a few days later transmitting the disease to other persons, in two cases the form of the parasite that actually came under our observation was the gamete, *i.e.*, the form which when ingested by the mosquito is capable of undergoing metamorphosis in the body of that insect.

In the abundance of mosquitoes of the *Anopheles* genus above described, with their breeding-grounds almost close up to the Government buildings, and in the near proximity of an extensively infected native population, by which many of these mosquitoes are being continuously rendered infective to healthy persons who may be bitten by them, we have the factors that account sufficiently and conclusively for the fevers that have prevailed among the Government officers at Tai Po.

We are of opinion that the seasonal increase of fever cases that has been observed at the time of ploughing, and at the period of harvesting the two rice-crops, is due to the disturbance at these times of mosquitoes usually resting among the grass or growing paddy, and feeding on Chinese coming within their reach, such disturbance resulting in their flying further afield and finding their way in larger numbers to the houses on the hills.

Having given our most careful consideration to the facts above stated, in all their bearings, we have come to the conclusion that all temporary measures for the improvement of the health of the station at Tai Po should be superseded with as little delay as possible by a definite scheme for the complete eradication of the breeding-places of the *Anopheles* mosquito over a wide area surrounding the Police Station.

The district involved is too large to be efficiently dealt with by any culicidæ; the cutting and clearing of long grass and shrubs from the hillside is only a subsidiary measure, though undoubtedly a useful one; the mosquito curtain, especially if put down an hour before dusk and kept down as long after sunrise, is a valuable preventive of the approach of mosquitoes at night, but with definite limits to its usefulness; and drugging with large quantities of

* Not printed

quinine is manifestly undesirable as a permanent method of dealing with the matter.

We consider that we have no alternative but to recommend, as the one means of rendering the Police Station and its neighbourhood more healthy as regards malaria, the acquirement and reclamation or efficient drainage of all the paddy-fields within a radius of 250 yards from the foot of the hills on which the houses stand, including to the north-west the whole of the marshy water-bed to which we have already referred as a large permanent breeding-place of the malaria-bearing mosquito.

Finally, we recommend that the matsheds in use for the accommodation of the Civil Staff, affording as they do ready cover for adult mosquitoes, and also rendering the inmates liable to chills at night, should be replaced by permanent buildings; and we venture to suggest for the consideration of His Excellency that a more suitable and healthier site than those that have been proposed is available for the purpose. Observing that no permanent foundations for these buildings have yet been laid, and that an island, 900 yards due east of the Police Station.

A SLIDE-TRAY FOR WARD USE.

THE accompanying illustration shows a very convenient Slide-tray for ward purposes, devised by Dr. Chung, resident surgeon in the Tung Wah Hospital, Hong Kong, for his own use in making blood examinations. It consists of a solid piece of teakwood, 1 ft. 2½ in. long by 6 in. broad, in the upper part of which ten spaces for slides have been hollowed out, while below there is inserted a long narrow strip of Chinese porcelain slate, a little over an inch broad. He carries the tray round the wards, jotting with a lead pencil the name of the patient below the corresponding slide. The slides are examined at leisure, and similar jottings of the results of examination for the parasites of malaria, in terms of Messrs. Bale, Sons and Danielsson's Malarial Chart, made to be entered up in the permanent records when convenient. The tray has proved exceedingly useful in actual practice, and I have asked Dr. Chung's permission to send a note regarding it to *THE JOURNAL OF TROPICAL MEDICINE*.

Hong Kong, Dec. 18, 1900.

J. C. THOMSON.



SLIDE-TRAY FOR WARD USE, DEVISED BY DR. CHUNG, HONG KONG.

and well removed from any considerable native population, is being connected with the mainland by a solid road and bridge, in order that a pier may be constructed from it to reach deep water, we made a careful examination of this island. We found no larvæ of mosquitoes, and should any breeding-places come to light after the thick undergrowth is cleared away, they could be readily eradicated. The location would probably be found convenient for executive purposes on account of the proximity of the proposed pier, and its isolation would render it much less malarious than either of the proposed sites even after the improvements we have suggested for the existing Police Station have been carried into effect.

It would be further conducive to the health of the Civil Staff, if the building were erected in two storeys, the ground floor to be used for office purposes, and residential quarters provided entirely on the upper floor.

MALARIA AND ELEPHANTIASIS IN RELATION TO MOSQUITOES IN THE MARQUESAS ISLANDS IN THE PACIFIC ARCHIPELAGO.

In a letter to the *Lancet* dated January 18, 1901, by Mr. H. D. O'Neill, an interesting observation by Robert Louis Stevenson is referred to, on the subject of mosquitoes and their association with filaria and malaria: "In Atuona (Marquesas Islands), a village planted in a shore-side marsh, the houses standing everywhere intermingled with the pools of a taro-garden, we find every condition of tropical danger and discomfort, and yet there are not even mosquitoes, nor even the hateful day-fly of Wuka-Niva, and fever and its concomitant, the island fe'efe'e, are unknown.

The absence of fever and elephantiasis from a locality which is also free from mosquitoes is a most interesting and suggestive observation.

THE QUEEN'S DEATH.

THE life and character of Queen Victoria have been so admirably and fittingly expressed by the statesmen who spoke in the House of Lords and the House of Commons on January 25, 1901, that they may be truly said to have truly indicated the depth of feeling and sorrow which at the present moment pervades the realm. The Marquis of Salisbury, on moving an address of condolence, said :—

“ We are echoing the accents of sorrow which reach us from every part of the Empire and every part of the globe, and which express the deep and heartfelt feeling—a feeling deeper than I ever remember—of the sorrow at the singular loss which, under the dispensation of Divine Providence, we have suffered, and of admiration for the glorious reign and the splendid character of the Sovereign whom we have lost. My lords, the late Queen had so many titles to our admiration that it would occupy an enormous time to glance at them even perfunctorily; but that on which I think your lordships should most reflect, and which will chiefly attach to her character in history, is that, being a constitutional monarch with restricted powers, she reigned by sheer force of character, by the loveliness of her disposition over the hearts of her subjects, and exercised an influence in moulding their character and destiny which she could not have done more if she had had the most despotic power. She has been a great instance of government by example, by esteem, by love; and it will never be forgotten how much she has done for the elevation of her people, not by the exercise of any prerogative, not by the giving of any commands, but by the simple recognition and contemplation of the brilliant qualities which she has exhibited in her exalted position. My lords, it may be, perhaps, proper that those who, like noble lords opposite and myself, have had the opportunity of seeing the close workings of her character in the discharge of her duties as Sovereign, should take this opportunity of testifying to the great admiration she inspired and the great force which her distinguishing characteristics exercised over all who came near her. She always maintained and practised a rigorous supervision over public affairs, giving to her Ministers her frank advice and warning them of danger if she saw there was danger ahead; and she certainly impressed many of us with a profound sense of the penetration, almost intuition, with which she saw the perils with which we might be threatened in any course it was thought expedient to adopt. She

left upon my mind, she left upon our minds, the conviction that it was always a dangerous matter to press on her any course of the expediency of which she was not thoroughly convinced; and I may say with confidence that no minister in her long reign ever disregarded her advice, or pressed her to disregard it, without afterwards feeling that he had incurred a dangerous responsibility. She had an extraordinary knowledge of what her people would think. I have said for years that I always thought that when I knew what the Queen thought I knew certainly what view her subjects would take, and especially the middle classes of her subjects. Such was the extraordinary penetration of her mind. Yet she never adhered to her own conceptions obstinately. On the contrary, she was full of concession and consideration: and she spared no effort—I might almost say she shrank from no sacrifice—to make the task of conducting this difficult Government more easy to her advisers than it would otherwise have been. We owe her gratitude in every direction—for her influence in elevating the people, for her power with foreign Courts and Sovereigns to remove difficulties and misapprehension which sometimes might have been dangerous; but, above all things, I think, we owe her gratitude for this, that by a happy dispensation her reign has coincided with that great change which has come over the political structure of this country and the political instincts of its people.

She has bridged over that great interval which separates old England from new England. Other nations may have had to pass through similar trials, but have seldom passed through them so peaceably, so easily, and with so much prosperity and success as we have. I think that future historians will look to the Queen's reign as the boundary which separates the two states of England—England which has changed so much—and recognise that we have undergone the change with constant increase of public prosperity, without any friction to endanger the peace or stability of our civil life, and at the same time with a constant expansion of an Empire which every year grows more and more powerful. We owe all these blessings to the tact, the wisdom, the passionate patriotism, and the incomparable judgment of the Sovereign whom we deplore. I have also to move that we present our congratulations to his Majesty on his accession to the Throne, and to convey the assurance to his Majesty of our loyal attachment to his person, and, further, of our earnest conviction that his reign will be distinguished, under the blessing of Providence, by an anxious desire to maintain the laws of the kingdom and to promote the happiness and liberty of his subjects.”

THE
Journal of Tropical Medicine

FEBRUARY 1, 1901.

THE CAUSE OF BERI-BERI.

CAPTAIN E. R. ROST'S INVESTIGATIONS.

AN important contribution to medical literature as to the cause of beri-beri, has been made by E. R. Rost, Captain I.M.S., and published in the *Indian Medical Gazette* for December, 1900. This is not the first time that beri-beri has been associated with rice eating, and still further, with rice of an inferior quality, but all our previous attention has been directed to rice itself as a food, and as a physiological factor in inducing a condition of blood or tissue in some way conducive to the development of beri-beri.

Captain Rost has, however, drawn attention to the possibility of infection conveyed by a micrococcus inhabiting rice, and he has, acting in this belief, experimented in a careful and scientific manner in elucidation of the possibility. Rice liquors of various kinds and from different sources were examined, and the organisms found in these several liquors proved to be identical. In the yeast also, which the Chinese in Burmah obtain from Singapore and use to ferment their rice liquors with, the same organism was found. The evidence, however, goes farther, and Captain Rost asserts that he found in the blood and the cerebro-spinal fluid of beri-beri patients, the same organism as he met with in rice-water.

The morphology of the organisms found in the microscopic examinations, was observed in the cultures produced "in sterile rice broth, in beef broth, in blood, in hydro-thorax fluid, and in acetic fluid." It was noticed in carrying out control experiments "that it was with extreme difficulty that the organism could be killed, and a temperature of 220° F. for nine hours was found to be necessary to kill off the spores. Cultures from several media were injected into fowls; those from rice-water gave rise to reactions in the fowls; those from cerebro-spinal fluid, and from blood in broth, in blood serum and in rice

broth, produced the organism in the blood and in the spinal cord of the animals experimented upon.

"The organism is a diplo-bacillus which generally is seen as an angular organism; it develops by spores, the spores split into two, become elliptical and grow out into rods."

Between the starch cells these angular diplo-bacilli are occasionally to be seen, as well as micrococci, which (latter) Captain Rost claims are the spores of the organism.

The organism is readily stained by carbo-fuchsin. It is very active and moves along wagging one end in front of the other.

As the result of repeated examination of the blood of thirty-two cases of beri-beri the organism was found "in every one of the cases on each occasion." Owing to the rod-like configuration of the organism it is possible that during the microscopic examination of fresh specimens only the rounded end of the rod presents itself, but after prolonged watching the organism may be seen to show itself lengthwise.

Blood after incubation for twenty-four hours at 37° C. is found full of the characteristic organisms, and in cover glass preparations ringed by vaseline the organisms have been noticed to increase in numbers.

Captain Rost checked his experiments by "control" fowls. He visited the native bazaars and examined the methods of making the rice liquors. He noted that the chief frequenters of these shops suffered most from beri-beri; he, in fact, made a thoroughly scientific enquiry into the subject, and if the chain of bacteriological enquiry is as yet not quite complete, he has certainly sufficient grounds to bring it forward as a working hypothesis that beri-beri is due to the micro-organism he describes.

—♦—
TWENTY-FIVE THOUSAND DEATHS FROM PLAGUE IN THE MYSORE STATE.—Lord Curzon, Viceroy of India, has stated that since the appearance of the bubonic plague, in 1898, 25,000 deaths from the disease have occurred in the Mysore State.

THE Tuberculosis Congress, which is to open in London on July 22, is to be a widely-attended function. Professor Koch, of Berlin, will be among the speakers.

THE REPORTS OF THE MALARIA COMMITTEE OF THE ROYAL SOCIETY.

THREE reports have up to the present been issued by the committee appointed by the Royal Society to inquire and report upon malaria and its prophylaxis. During the year 1900, reports were issued on July 6, August 15, and December 31. Drs. C. W. Daniels, J. W. W. Stephens, and S. R. Christophers, have been the chief contributors to the report, and some valuable additions to our knowledge of malaria have resulted. The localities in which the investigations were conducted were chiefly in West Africa, but information gained in other malarial countries has been freely taken advantage of.

MALARIA AS IT AFFECTS NATIVE CHILDREN.—The immunity claimed by some observers in the case of natives is not borne out by the evidence contained in this report. It would appear that the adult native is less prone to the attacks of fever than are European immigrants of corresponding ages, but the explanation of this is one of the points which the Malarial Committee has thrown considerable light upon. From researches in Lagos and Accra by Christophers and Stephens, the infectivity was proved to be as follows:—

Children under 2 years	23 to 100 per cent. were infected.
„ between 2 to 5 years	74.1 „ „ „ „
„ up to 8 years	57 „ „ „ „
„ up to 12 years	20 „ „ „ „

Seeing that the number of parasites varies considerably during a series of investigations, being met with one day and found absent the next, it may be safely stated, that the condition of infection in children may be termed as being *constant* until the age of ten or twelve years is approached. This period—ten years—is termed the “age limit” of constant infection by Christophers and Stephens. A significant fact reported is that children may have the æstivo-autumnal parasites in their blood and yet appear in excellent health, and need not suffer from fever. This observation confirms a remark made some time ago now by a well-known tropical practitioner, “that all persons in malarial countries have the malarial poison in their blood, and that it only requires some exciting cause, such as chill, over-exertion, or illness, to set the toxic influence free and generate fever.” This condition of infection of young children without febrile disturbance gives rise to several speculations. This may be due to a natural insusceptibility of the native African to malaria, or it may be due to an immunity transmitted from the parent to the offspring. As regards the immunity of adults, it is stated: “We have further a condition of active immunity in the adult native, an immunity acquired as the result of many years (ten) of infection with parasites. The immunity is accompanied by a progressively scantier development of parasites, and it is comparable to that described by Pawlowsky for infection with micro-organisms.”

The Commonest Species of Anopheles in tropical Africa is the *A. funestus*—the small “black” mosquito. It is met with at all heights up to 5,600 feet in some localities, and it has been shown to harbour malarial parasites.

The Larvæ of Anopheles are mostly met with in

pools, which, however, may be merely of a temporary character, but they may be found in brooks and even in brackish water containing 0.6 per cent. of salt. In places remote from human habitations *Anopheles* were found, but in much fewer numbers than in the neighbourhood of villages.

The Continuance of the Species.—The question of how the *Anopheles* survive the dry season has long proved a vexed question. At one time it was believed that the ova lay dormant in the dry earth and developed with the onset of rain. This belief, however, is combated by observations in nature and by experiment. Ova of *anopheles* after being desiccated on blotting paper for a little over forty-eight hours could not be hatched. Earth collected from dried-up pools, in which the mosquitoes had deposited their eggs, did not give any evidence of larval development when water was added to it. On the other hand, adult *anopheles* were found during the dry season hidden away in the most secluded portions of native huts, and in these long-lived *anopheles* ova were found in a state ready to be deposited, and which no doubt were deposited when the return of the rains afforded suitable pools for the purpose.

Anopheles harboured the malarial parasites in some localities in every individual mosquito examined. This was especially the case in native quarters; and the proportion of children infected varied directly with the facility afforded the mosquitoes to breed.

Prophylactic Measures.—The several observers agree that the infection, of human beings and of mosquitoes, is so general in the parts of Africa where their investigations were carried on, that at present the stamping out of malaria by either medicine or by sanitary measures seems hopeless; the utmost that can be done is to ascertain—

How to Protect Europeans from Malaria.—The recommendations are:—

(1) To use mosquito nets slung from the top of the bed and tucked in under the mattress. The bell-net, and attempts to maintain the hanging net in position by the bottoms being shotted, are condemned as inefficient.

(2) The mosquito “house” around the bed, or a mosquito-proof room, are considered efficacious provided the mesh of the gauze is sufficiently fine.

(3) Protection of the feet and ankles from the attacks of mosquitoes is essential; this may be accomplished by high boots, double socks, &c.

(4) Fumigation of dwellings and of boats at regular intervals.

(5) The separation of European from native quarters in towns and villages by at least 400 yards, as it is proved mosquitoes can fly considerable distances.

(6) European convalescents from fever should be carefully guarded against the attacks of mosquitoes, both for their own sakes and in consideration of the possibility of being a source of infection to their neighbours.

All the contributors to the report agree “that malarial fever is a contagious disease contracted through the medium of the mosquito from the native child.”

THE MARY KINGSLEY SOCIETY OF WEST AFRICA.

THE desire has been very widely expressed among Miss Kingsley's many friends, and among the still larger number of those who knew her through her writings and lectures, to establish a permanent Memorial to her.

It is in a great measure owing to Miss Kingsley's writings and her absolutely unique researches into native customs and institutions that so much interest has recently been taken by the general public in West Africa. She herself took a deep interest in all that might in any way tend to the improvement of the conditions of life in that part of the world, both of Europeans and of the natives.

Many of Miss Kingsley's friends desire that her name should be associated with a Society for the study of Native Customs and Laws, which was her first object and occupied the greatest part of her time and energy, and that "The Mary Kingsley Society of West Africa" should be established to stimulate, research and to collect from all sources information concerning West Africa.

Miss Kingsley held that the right way to bring out the full value of British West Africa is not in the direction of trying to force European civilisation and customs on natives who already have a different, if rudimentary, social system of their own, but first to study this indigenous system, which must to some extent be suited to its environment, and then to select from this, and to develop, the better and more useful elements. It is believed that much information of the required kind as to West African sociology is already on record, scattered through the works of the older writers on those parts, as well as in more recent books of travel, in papers published in periodicals, in blue books, and in official reports; and a very great deal more may still be gathered by Government officials, traders, missionaries, travellers, and by the small but remarkable band of natives who are already educated. The Society, however, would not confine its papers exclusively to the subjects of tribal institutions and customary usages, but would be prepared to consider any article that might aid towards throwing light on the social conditions of the country.

It is proposed that the Society should employ a trained ethnologist both to collect and arrange in scientific form the material which is thus already on record, and to institute and direct research for further material of the same sort; and, after the manner of the Royal Asiatic Society, to publish periodically the results which it obtains, and thus provide additional knowledge by which European relations with West Africa may be most safely and effectively directed, with profit both to the natives and to the Empire. The publication would take the form of a Journal, to be issued quarterly to subscribers of *One Guinea* annually. Any special help given toward the initial expenses which will have to be met would be most important and welcome. And the Committee, having regard to this original character and purpose of the Society as a Memorial to Miss Kingsley, would be very glad to obtain some additional aid upon this consideration, either by way of donations, or of higher annual subscriptions for the first three years.

Subscriptions may be sent to the Hon. Treasurer,

MR. GEORGE MACMILLAN,
St. Martin Street, Leicester Square,
London.

or to the Hon. Secretary,

MRS. J. R. GREEN,
14, Kensington Square,
London.

British Medical Association.

THE CYPRUS SPHALANGI AND ITS CONNECTION WITH ANTHRAX.

(CALLED LOCALLY "SPHALANGI BITE.")

By GEORGE A. WILLIAMSON, M.B., C.M.Aberd.,
Cyprus.

(Continued from p. 35.)

SYMPTOMS OF A TYPICAL SEVERE CASE OF "SPHALANGI BITE."

The patient, Aspasia Nicolaon, aged 50, was sent to me on September 22, 1899. On the night of September 18, while sleeping on a trestle bed placed against the wall in the yard of the house, she was awakened by feeling at the right temple a pain like the prick of a needle; she at once concluded that she had been bitten by a sphalangi, especially as there were many insects on the wall. On getting up in the morning she noticed a small pimple at the spot where she had felt the pain during the night—she was sure this pimple had not been there when she went to bed. Swelling rapidly set in, till both eyes became closed. The central eschar was very slightly raised, dark brown, and about the size of a sixpence, having a slight, clear odourless discharge. Ten small secondary vesicles were counted round the eschar; the swollen parts were indurated, not "boggy." On microscopical examination of the discharge, large numbers of anthrax bacilli were discovered, as well as numerous lymphocytes.

The treatment adopted was cauterisation by thermocautery, and the injection hypodermically at different spots round the eschar of a solution of mercuric chloride and potassium iodide in water.

The case went on to complete recovery.

SOURCE OF INFECTION.

The source of infection here appeared to be a sheep, which died of phlangari, and whose carcass had been thrown, a week before Aspasia Nicolaon took ill, into a field adjoining the yard of the house she occupied. Aspasia, a woman of loose morals, had not been engaged on any work, such as hide dressing, &c., by which infection might have been got.

REMARKS ON OTHER CASES.

Mehmed Ali Bilal was in hospital in July, 1899; he actually felt the sphalangi on his face, and the swelling, which began almost at once, became severe next day. It is interesting to learn that during the week preceding his illness two of his sheep died of "phlangari." Unfortunately he allowed eight days to elapse before he presented himself at hospital, so that Dr. Cleveland (under whose care he was) had great difficulties to contend with in the treatment, and the delay probably accounts for the severe ectropion and loss of sight from which he now suffers. He declined to have the ectropion operated on.

A similar case, ending in severe ectropion also, occurred at the same time in the same village, and was probably due to infection from the same carcass of sheep as in Mehmed's case; here, after some weeks' suffering, the patient recovered. She ascribed the disease to the bite of sphalangi sustained while she was sleeping in the open at night.

A few other cases came under my notice, but were not so marked as the foregoing.

SIMPLE SPHALANGI STING.

Three cases where the persons were supposed to be bitten by sphalangi were also observed (in one of which the insect was actually picked off the face) where the resulting symptoms were slight, or, in other words, such as one would expect to find from the sting of an insect like the *Mutilla* and in accordance with the zoological fact stated by Professor Trail. One of these cases is of sufficient interest to be

quoted—a woman came in a great state of fear, saying that she had been bitten by a sphalangi the night before, while collecting brushwood in her yard (the brushwood had no prickles); she said that she saw an insect like a sphalangi run off her hand after “biting” her, but, it being dusk at the time, she could not describe its appearance more accurately. On the back of the hand, a dark red spot about the size of a threepenny piece was distinctly evident and round this the hand was swollen and red up to the wrist; the arm was tightly bound with a piece of cord in the hope of stopping the spread of inflammation—on microscopical examination of the exudate no bacilli were to be discovered, and I ventured to tell her that, by applying carbolic fomentations, she would be well in a day or so, as, indeed, happened.

Reasoning on these cases the conclusion seemed justifiable that the sphalangi sting in itself is no serious matter, but if at the same time anthrax is inoculated the results may be very serious indeed, and perhaps a fatal issue may ensue.

DIAGNOSIS.

To distinguish between these two conditions (simple sting and inoculation of anthrax), a microscopical examination appears to enable one to come to an absolutely sure decision, as shown in the last-mentioned case, which had all the external appearances that one would expect to find about ten hours after the inoculation of anthrax by the sting.

TIME WHEN SPHALANGI ARE FOUND AND “SPHALANGI DISEASE” OCCURS.

Sphalangi are found and cases of sphalangi disease occur only during the hot months of the year, when also “phlangari” is most prevalent. This concurrence seems important as pointing to a connection between the three; and the fact that the sting has generally happened to persons while they have been sleeping in the open suggests the idea that their instinctively, before properly awake, trying to rub off the insect, whose movements on their face or other exposed parts they have felt, is regarded by the sphalangi as an attack, to be met by its only means of self-defence—its sting.

ADVANTAGES RESULTING FROM IDENTIFICATION OF SPHALANGI, &c.

I venture to claim that the beneficial results from a clear recognition of the sphalangi and its power of causing inflammation and transferring diseases are the following:—

(1) By the recognition of the anthrax bacillus in cases which are typically “sphalangi disease,” it is now certain that the disease is anthrax.

(2) Being sure, by the discovery of the anthrax bacillus, of the nature of the disease, the correct treatment may be at once begun.

(3) By the microscopical examination of the exudation at the seat of inoculation a certain diagnosis is without difficulty made.

(4) Greater certainty in prognosis is possible, the cause of disease being known.

(5) The certainty with which, in the absence of anthrax bacilli in a supposed case of “sphalangi disease,” the patient may be told that no serious results will follow.

(6) The explosion of the idea, which caused so much fear amongst the people generally, that in Cyprus an insect existed having such a powerful poison in itself as that attributed to the sphalangi.

CONCLUSION.

In a few words, the explanation I offer of the nature of sphalangi disease is as follows:—The severe symptoms are due to anthrax which has been inoculated by the sphalangi's sting, or by the insect carrying on its body (probably on the fine hairs) anthrax infective material to an abraded surface, the sphalangi being a foul feeder, and carcasses of animals dying of “phlangari” (anthrax) being too often left exposed or buried without precautions being taken to prevent the spread of the disease.

SOME SUGGESTIONS FOR THE IMPROVEMENT OF SANITARY AND MEDICAL PRACTICE IN THE TROPICS.

By RONALD ROSS, D.P.H., M.R.C.S.

Lecturer in Tropical Medicine, University College, Liverpool.

I PROPOSE to suggest in this brief paper some improvements in medical organisation in the tropics—improvements which have long been required, and which I think could very easily be made. Many of the points have already been mooted by Ernest Hart, Manson, and others; and most of them seem to be so obvious as scarcely to require lengthy comment. I recall them now in the hope that something may shortly be done in the directions indicated.

1. *Instruction in Animal Parasitology.*—Several of the principal tropical diseases, malarial fever, dysentery, ankylostomiasis, elephantiasis, endemic hæmaturia, and others, are, or may be, caused by animal parasites; yet, in my experience, few medical men have made any particular study of such organisms. One does not often meet men who are quite familiar with the parasites of malaria, for instance. Few are able even to detect the presence of worms by the microscope. I once met a hospital assistant—a man who had recently received his diploma—who was in charge of a hospital full of cases of ankylostomiasis; he had never even heard of the disease, and was treating his cases for malarial cachexia! Even in our leading medical literature one often sees zoological names improperly written—a fault often committed, I fear by myself, amongst others. A knowledge of comparative parasitology is still more rare, leading many medical men to adopt a sceptical attitude toward ideas which have long been commonplaces among zoologists. Thus one controversialist refuses to believe that the *Hæmaphysalis* possess two cycles of development, because, he says, it is impossible for an organism to have two methods of propagation! The remedy is to give more attention to animal parasites in the ordinary pathological curriculum.

2. *Instruction in Tropical Medicine.*—I need not discuss this question, which has already received much attention. I must point out, however, that it is not sufficient to instruct only those who have joined the medical services. Hundreds of medical men are called to serve as ships' doctors or as private practitioners in the tropics, or may be suddenly enlisted in our wars, as at present in South Africa. Special attention to tropical medicine should always be given in the ordinary medical curriculum.

3. *Special Questions in Examinations.*—Such results are not likely to be fully attained until every examination paper on pathology and medicine contains at least one question on animal parasitology and one in tropical medicine.

4. *Literature.*—In my experience it is generally very difficult to obtain in the tropics any literature except that which is contained in the most popular textbooks and periodicals. Application to booksellers at home for even the most important monographs is often a fruitless procedure and is always a slow one; while it is hard for medical men, especially for those who belong to the services—to drag about with them several hundredweight of books. Yet no one can deny that the perusal of the leading medical literature is an absolute essential to medical proficiency. Small but up-to-date libraries should exist in all the leading towns in our tropical possessions, especially in connection with our principal Government hospitals. It is impossible to understand why such a want has not been attended to long ago. As an instance of the urgency of the want I may mention that I once found it impossible to obtain, even in the capital of India, a classical memoir on *Amoeba coli*, which one would think should have been read by every medical man in the country. Perhaps it would be possible to arrange, through the Library of the British Medical Association, an agency for the supply of monographs to the tropics, either by loan or sale.

5. *Microscopes.*—It is also impossible to understand why the larger hospitals in the tropics are—or were a little

while ago—so seldom supplied with microscopes with oil-immersion lenses. There can be no doubt that every large hospital, and indeed, every medical man in the tropics, should have them. The smaller hospitals in localities where *Ankylostoma duodenale* abounds should possess instruments for the detection of the ova.

6. *Other Apparatus*.—Antitoxins, antivenene, and apparatus for bacteriological diagnosis, such as material for the Grünbaum-Widal test, should exist in the principal towns. Where such apparatus belongs to Government, it should be open for the use of private practitioners on payment. The same should hold in the case of Government medical libraries.

7. *Medical Regulations*.—These should be compiled and issued with the greatest care. It is impossible to conceive worse regulations than, for instance, those which held sway when I was in India. Ill-arranged, spread over many publications, confused, ill-worded, and often unintelligible—if not contradictory—they were the despair of most executive medical officers. They were, moreover, scarcely up to date from the scientific point of view.

8. *Municipal Sanitary Regulations*.—The same must be said of most municipal laws and regulations which I have studied—and I have studied many. They are also often *ultra vires*, or impracticable in the law courts. It seems to me that these regulations should be in the charge of a skilled central authority.

9. *Organisation of Research*.—If the medical profession wishes itself to be considered a scientific profession, it must ever maintain it to be its highest obligation to make strenuous organised efforts towards discovering the natural laws which govern the progress, propagation, and treatment of disease; it is not right for us to content ourselves merely with the efforts of a few private enthusiasts. The country confides in us to preserve it as much as possible from disease; if we do not, as a body, take the trouble even to ascertain the nature of disease, we shall end by losing that confidence—that is all. It cannot be said that in the past the profession has done all it should have done in this line—at least in regard to tropical diseases. The way in which the discoveries of Laveran and Manson have been neglected by us for years has become a by-word. Giles's work on the life-history of so important a parasite as the *Ankylostoma duodenale*, done many years ago, has not even yet received confirmation or rejection. Cunningham's important work on the life-history of *Amoeba coli* and *Cercomonas intestinalis* seems to have been absolutely forgotten. Our public researches, even on such diseases as cholera, tropical typhoid, dysentery, and beri-beri, have been small indeed when compared with the havoc wrought by these maladies.

It seems to me that research can be organised in three ways: By the foundation of research laboratories, by the appointment of specialists to prosecute certain definite lines of investigation, and by the encouragement of private research. Though a great clamour for the foundation of research laboratories has arisen, and though I quite agree that bacteriological institutes should exist in all our principal colonies—if only for current executive pathological work—I think that this costly method is not likely to give the best results for the least money. Many such laboratories already exist without yielding much profit, while bricks and mortar, expensive appliances, and fixed appointments are not required for many important investigations. The second method—that of delegating certain researches to certain men—seems to me a better one; but even this method is somewhat costly, and is often likely to fail on account of the difficulty of selecting the suitable man. In my own humble opinion the best way of dealing with the subject is to encourage private research by large pecuniary rewards.

On the whole the man who has the best opportunities for studying disease is the medical practitioner. In the tropics, especially in the medical services, numbers of men have the most admirable opportunities for research as well as abundance of leisure to prosecute it. Few attempt it, and the rest are blamed for their neglect. The blame is quite

unjust, because, as a matter of fact, scientific investigation is no part of a doctor's duty. We did not enter the medical profession for philanthropic purposes, but in order to make a living; we are not justifiably called upon to spend our leisure in laborious pursuits for nothing. Observation, clinical study, the study of treatment, indeed, are remunerative, as they ought to be; they bring advancement and often wealth by way of private practice. But it is otherwise with the laborious and highly specialised kind of investigations to which I refer. Although they are of the highest value to mankind, experience—such for instance as that of the great Vandyke Carter—shows that they generally bring no remuneration—at least, none which will compensate for the loss of money, time and opportunity which they often occasion. Under the present conditions it is impossible to recommend men who have to live by their profession to undertake such studies.

Of course many men will undertake such studies for nothing; but if we wish to stimulate a large number of men to undertake them we must make it worth their while. In my opinion the occasional donation of a prize of some thousands of pounds for really notable investigations is probably the best way—though it need not be the only way—to ensure rapid scientific advance in the profession. The money can be found if the proper effort be made, and I think that the British Medical Association is the most suitable body to undertake the task of considering the matter.

10. *A Central Scientific Authority*.—I think that we have long felt the need of some strong central authority to encourage and support medical scientific research in the tropics, and to insist on those reforms in medical and sanitary practice which the progress of science continually demands. The instances already cited seem sufficient to establish the necessity for some force of this kind. Experience shows not only that investigation has not been adequate, but that even when important researches are made they are apt to be lost sight of, while the authority of individuals of the highest scientific distinction often fails for years to break down the inertia and scepticism which oppose new ideas. In matters of life and death, which medical science has to deal with, this sluggishness of thought and action is scarcely justifiable.

How a central authority of the kind I refer to is to be constituted I need not discuss at present. Perhaps we already possess the necessary organisation. The Royal College of Physicians and the Royal Society are already stirring in the matter of tropical medical science; we may hope that these and other societies will soon "force the running" still more.

Dr. SARAT K. MULLICK (London) stated that there was urgent necessity for the appointment of specially trained investigators to fill the chairs in the medical schools of India. Until that was done the best interests of the schools would not be served, and there was little example or encouragement to students to take up special investigations.

Colonel KENNETH MACLEOD pointed out the difference between a teacher and one who devoted his attention principally to original investigations. Now and again an investigator was a good teacher but it was quite the exception, and the first essential to be sought for in one who held a lectureship was that he was a good teacher and exponent of the science and practice of medicine.

A DISCUSSION ON YAWS.

I.—JONATHAN HUTCHINSON, F.R.C.S., LL.D., F.R.S.

Consulting Surgeon to the London Hospital.

Mr. HUTCHINSON, who opened the discussion upon yaws, brought to the meeting a young man, an Englishman, from the West Coast of Africa, who he believed was the subject of yaws. The patient had been seen by medical men well acquainted with the disease in Western Africa, who had pronounced that he was suffering from yaws, and he had

also been seen by an old tropical practitioner in Liverpool shortly after he landed, who also agreed with the diagnosis. The patient, when stripped, presented a large number of scars and pigment-stained patches in his lower extremities, and also some less marked lesions on his forearms and wrists. Mr. Hutchinson stated his firm conviction that yaws is syphilis modified by race and climate. He considers that syphilis found its way into this country not from America but from the African coast. In fact, when traffic commenced between the West African coast and Western Europe syphilis appeared. In Fiji syphilis was unknown, but yaws prevails there most extensively. He considers this a strong argument in favour of his theory, as where the poison of yaws exists there it is impossible that the poison of syphilis can prevail, as the population is already protected by the fact of their having yaws. He knew his opinion was contrary to that of many who have carefully studied this disease, such as Sir William Kynsey, Dr. Daniels, Dr. Nicholls, and others. He had had many pictures and photographs of cases of yaws sent him from many parts of the world; but he drew opposite conclusions from these pictures to what those who sent them did. They were mostly sent to prove the diversity between yaws and syphilis; but in place of that, when pictures of cases of yaws and syphilis were placed side by side, the similarity of the two diseases seemed most striking, and these pictures, to his mind, confirmed his theory. Why yaws was not seen in England was because any European who contracted the disease in the tropics came back with syphilitic signs and symptoms. The granulomatous nature of many tropical ailments was most marked, and in the case of yaws, the granulomatous excrescences disappeared when a more temperate climate was reached. The idea that there was no primary sore in yaws he did not believe. Yaws was frequently contracted by a skin abrasion, and it was a common matter of clinical observation that many cases of blood poisoning occur without the development of any marked local sore or inflammatory area. When, however, in yaws an enlarged group of glands occurred, and careful search made for either a local sore or for signs of inflammation in the lymphatics leading towards the group of glands, he had little doubt then, in the early stages of the disease, a sore would be found. Mr. Hutchinson mentioned the case of a surgeon who pricked his finger doing a *post-mortem* examination on a case of yaws and developed typical syphilis when he came to this country. The tradition that the Fijians are liable to a peculiar liver disease, thickening, &c., seems to point to a syphilitic form of disease, and Mr. Hutchinson has no doubt that they are late and congenital effects of yaws. Sibbens in Scotland and the *frambæsia* that occurred in Cromwell's army in Scotland are no doubt examples of local outbreaks of yaws, that is syphilis misnamed or neglected. In Dublin a number of cases with raspberry-like eruption occurred in young men and one woman, and, although the eruption was styled *frambæsia*, it was cured by mercury.

II.—E. DAVIES, M.D. Samoa.

Dr. DAVIES said that he had seen yaws in Fiji and in Samoa, but that it always occurred in children, and he failed to see how sailors could become affected from children. Yaws was carried to Samoa by Fiji immigrants. Yaws did not exist in the Ellis group of Polynesian islands. He found calomel the best treatment for yaws.

III.—PATRICK MANSON, M.D., C.M.G., LL.D., F.R.S. Physician to the Seamen's Hospital Society, Greenwich.

Dr. MANSON thought that Mr. Hutchinson's views on the relation yaws bears to syphilis open to doubt. The case he had just shown rested for diagnosis on the opinion of others, and he thought Mr. Hutchinson was too credulous. Although the two diseases resemble each other in a few points that was no more conclusive as to their identity than was leprosy and tubercle identical diseases because the

bacilli of both agreed in many points. Inoculation by yaws will not protect against syphilis nor *vice versa*, and it is strange if the two diseases are identical that this should be so. If sailors get syphilis from females affected by yaws we ought to meet with transition stages of the disease in this country. Yaws, like many parasitic diseases peculiar to the tropics, could not be imported to colder climates, owing to the death of the parasite, owing to the absence of a continued high temperature.

IV.—D. C. REES, M.R.C.S., L.R.C.P. Superintendent of the London School of Tropical Medicine.

Mr. D. C. REES stated that he had seen many cases of syphilis and yaws in the hospitals at Cape Coast Castle. In the hinterland yaws were prevalent, but not syphilis, and the natives on the Coast looked upon syphilis as a new disease.

V.—KENNETH MACLEOD, M.A., M.D., LL.D. Professor of Clinical and Military Medicine in the Army Medical School, Netley.

Colonel MACLEOD said the case exhibited by Mr. Hutchinson was undoubtedly one of syphilitic infection. Whether the lesions are tertiary manifestations of yaws, or whether syphilitic infection was admitted through the breach of surface caused by yaws, or otherwise contracted, is a question admitting of difference of opinion. Mr. Hutchinson has referred to a pigment ulceration of the genitals in Fiji as a tertiary syphilitic manifestation. If this is the same disease as I first observed and described in India some years ago, and by Dr. Daniels in British Guiana, I am of opinion that it is in no sense syphilitic. As regards a solitary initial lesion produced by inoculation this is not peculiar to yaws but occurs in other diseases—cow-pox and small-pox, for example—in which inoculated lesions are apt to be single, and the lesions resulting from natural infection multiple. When the micro-organism causing syphilis and *frambæsia* is discovered, and found to be identical or distinct, the question raised by Mr. Hutchinson will be finally settled, but meantime the issue presented by him must remain very debatable.

Obituary.

DR. WALTER MYERS.

It is with sincere regret that we have to record the death of Dr. Walter Myers, M.A., M.B., B.C. Cambridge, B.Sc. London. Dr. Myers was one of the members of the Yellow Fever Expedition sent out by the Liverpool School of Tropical Medicine, and at the early age of 28 has fallen a victim to the fell disease he went to Brazil to study. By his death science is robbed of one of its most promising investigators, and tropical medicine especially of an enthusiastic worker. Dr. Myers' brilliant career as a student in Cambridge and London was supplemented by more advanced studies in Freiburg and Berlin. His remarkable attainments led to his selection as one of the expedition to inquire into the nature and infectivity of yellow fever. His death adds another name to the list of medical men who have perished whilst unselfishly devoting themselves to the cause of suffering humanity and to the advancement of science. A truly heroic death, but one which leaves us, in this instance, poorer in resource, and less fit to contend with those scourges of the tropics which decimate our countrymen, and thwart the material and social advance of the natives of the less favoured parts of the earth.

New Foods.

BEEF PLASMON.

THE indefatigable Plasmon Company have produced yet another preparation, styled Beef Plasmon. It is stated to be pure albumen and pure beef-extract, and any one can test the amount of albumen in the preparation by applying the ordinary tests for albumen, after dissolving some of the Beef Plasmon in a test tube with water. The preparation is tasteless, and therefore not intended to be used without some flavouring, but even with table salt it is palatable enough. We welcome this endeavour to supply a pure albuminous and meat-extract food. We have been so accustomed to the rather pleasant "burnt" flavour of our meat preparations heretofore, that we are inclined to look askance at a tasteless compound. It must be remembered, however, that it is purity we want in our invalid dietary, and not merely "sweet-meat" preparations, and we trust to the Plasmon Company in their honest endeavour to supply pure foods for invalid consumption. Were the Plasmon Company to condescend to flavour their preparations no doubt they would attain a greater temporal and ephemeral success; but we hope the Company will never be deluded into these tricks to please the palate and cheat the digestion.

The Company give ample directions how to use the Beef Plasmon, and leave us in no doubt as to the limits of time the preparation will keep after the jar is opened.

The preparation is so carefully put up that there is no likelihood of the Beef Plasmon being injured during a voyage; and we can therefore recommend, to all tropical residents and to medical practitioners in the tropics, this, the most recent and most efficient addition to our invalid dietary.

stant, their mobility was moderate, and they did not stain by Gram's method, nor did they liquefy gelatin. A pale-brown raised growth took place on potato. A lilac tinge was at first communicated to litmus milk, which in six or eight days afterwards, becoming alkaline, assumed a deep blue tint. On neither glucose nor lactose was gas produced.

When tested with the blood serum of dysenteric patients, the organism gave usually a positive result. Guinea-pigs injected intraperitoneally died in from one to six days. In these animals the small intestines showed points of ecchymoses. Peyer's patches were frequently found congested, and the lumen of the intestine was occupied by a glutinous material. This variety of the organism corresponds in all its properties with the bacillus found by Shiga in Japan to be present in all cases of "epidemic" dysentery. It may be asserted that when these bacilli are present, as in acute dysentery, the *Amœba coli* disappears, and again when the *amœba* is present, as in chronic dysentery, the bacilli in question is absent.

ON THE AGGLUTINATION OF THE BACTERIUM COLI.—Dr. C. Julius Rothberger has investigated the subject of the serum reaction in the group of coli associated under the name of *Bacterium coli commune*. The hope at one time entertained that bacteriology would serve to differentiate these bacteria has not been fulfilled. A number of investigations on this subject have been made, notably by Bensaude, Pfaunder, Smith, Wolf, Rodet, &c. Rodet states "that no two groups of the coli bacilli can be distinguished in which one exhibits a positive and the other a negative agglutination, but a gradual transition exists."

Dr. Rothberger is of opinion that a mixed serum affords the best medium for investigation.—*Zeitschrift für Hygiene und Infectious Krankheit*, May 23, 1900.

Current Literature.

BACTERIOLOGY.

FLEXNER ON THE ÆTIOLOGY OF TROPICAL DYSENTERY.—As the result of observations and bacteriological investigations on cases of dysentery which occurred amongst American soldiers in the Philippines, Flexner considers that tropical dysentery is of a bacillary and probably of an amœbic form. The method of investigation was by means of agar-plate cultures and the sub-culture of the colonies which developed in the agar. Bacillary colonies occurred regularly in the cultures made from the acute forms of the disease, and could be differentiated into two types. The bacilli of one type resembled the *Bacillus coli* in their properties, whilst the colonies of the other group closely agreed with those of the *Bacillus typhosus*. Pyogenic cocci were never absent.

In the bacilli which colonised like those of the *Bacillus typhosus*, although in average size they corresponded to the *Bacillus coli*, their length was incon-

DYSENTERY.

FOR DYSENTERY.—The following prescription has been used with marked success in the Mandoli Regimental Hospital at Bhurtpore in cases of acute dysentery:—

Ry	Quinin. sulphat.	..	..	..	gr. ij.
	Pulv. ipecacuanha	..	..	..	gr. v.
	Ammon. chloridi	..	..	..	gr. x.
	Tr. opii	..	..	..	℥ij.
	Aquæ, q. s.	..	..	ad	3j.

M. Sig.: To be given every four hours.

—*Ind. Med. Record*, Dec. 26, 1900.

TREATMENT OF AMŒBIC DYSENTERY.—The administration of medicated enemata is advocated by Aderhold. Several amœbacides are recommended to be employed on the enemata. Of these:—Sulphate of quinine, from 1 in 5,000 to 1 in 1,000 is advocated; or perchloride of mercury, from 1 in 10,000 to 1 in 5,000; or peroxide of hydrogen, 1 in 20 to 1 in 5; or a solution of methyl blue, from 1 per cent. to $\frac{1}{10}$ per cent. The enema should be given once or twice daily as the patient lies on his back with the hips elevated. The medication of the enema may be varied from day to day.—*Chicago Med. Record*, Feb., 1900.

LEPROSY.

ORIGIN OF LEPROSY IN HAWAII.—The *Journal of the American Medical Association* says:—"The introduction of leprosy in Hawaii, from recent statements, seems to have been under the special protection of the native royalty and aristocracy. It first appeared in the person of a chief Kakauonohi, who had been to China, and from him was transmitted to another Naea, who was closely related to the reigning family. From the latter it quickly spread to his tenants and retainers, and for a considerable time was known among the natives as the 'ma'i alli,' or the chief's, or royal, disease. The missionary physicians soon learned to recognise it, and one of them, Dr. Dwight Baldwin, it is said, made a report on it, stating the facts of its origin, &c., and filed it with the Minister of the Interior; but it was held from publication, doubtless on account of the connection of royalty with the introduction of the disease. So long as the Hawaiian monarchy existed, segregation of lepers, though legally demanded, was very imperfectly carried out, owing, it is said, to the interference in high places. Since the overthrow of the monarchy, however, the measures have been more effective, and the seeing of lepers on the streets, which was formerly an occasional event, is no longer possible. The isolation law is an unpopular one with the native Hawaiians, who possibly regret the passing of the old régime on that account as much as on many others. We have not seen this bit of medical history narrated elsewhere."

LIVER AILMENTS.

HEPATIC FORM OF TYPHOID FEVER.—Dr. H. Roger relates two cases of typhoid fever which presented a sudden fall of temperature, the one on the twelfth, the other on the fourteenth day of the disease, followed on the succeeding day by vomiting of a bilious character and a diarrhoea with stools of a yellowish-green colour. There was absence of meteorism, and no other indication of perforated intestine except progressive weakness, which ended fatally. At autopsy, the liver in both cases was found enormously enlarged, of a doughy consistence, and of a uniform reddish-yellow colour; on section the large vessels were seen to contain fluid blood, while the parenchyma was bloodless, homogeneous, and resembled fatty degeneration. Microscopic examination and chemical analysis confirmed this opinion. Experiments on dogs by injecting acetic acid into the common bile duct brought about a similar hypothermia with marked histologic changes in the liver. Dr. Roger concludes that a sudden sharp fall of temperature occurring at the time of the roseolar outbreak must find its explanation in the degeneration of the liver. This, together with a severe jaundice, bilious diarrhoea, and vomiting of bile, speaks for the clinical entity which the author describes as the hepatic form of typhoid fever.—*New York Medical Journal*.

MALARIA.

"**MOSQUITOES IN HONG KONG.**" By Drs. J. C. Thomson and T. M. Young, F.R.C.S.E.—In a Government report Drs. Thomson and Young report on the

collection of mosquitoes in Hong Kong. The area of the present investigation was in the Tái Pó district of what is called the new territory, that is, in the area of the strip of mainland lately ceded to Britain immediately opposite to the island of Hong Kong. The species obtained here is a larger one than that most common in Hong Kong, and we identify it as *Anopheles Sinensis*.

Drs. Thomson and Young recommended, to the Hong Kong Government, that a definite scheme should be initiated and acted upon for the complete eradication of the breeding-places of the anopheles mosquito, over a radius extending 250 yards from the particular police-station where their observations were made. They condemn mat sheds as dwelling places in a malarial district, owing to the cover they afford to mosquitoes.

A DIAGNOSTIC STAIN FOR THE PARASITE OF MALARIA.—Reinhold Ruge recommends the following:—

Water	...	100 cc. = 1690 minims.
Na ₂ CO ₃	...	3 grains.

Dissolve and heat, and while the solution is boiling add methylene blue (pure medicinal Höchst) 5 grains. Let the solution cool and stand for forty-eight hours. Filter, and it is ready for use. On the blood-preparation drop a few drops of this stain, and wash them off at once; the preparation is stained a dull violet. The red cells are stained yellowish-green to bluish-green; the annular parasites become blue-black; the larger forms of the parasite are coloured greyish-blue to dark blue; and the nuclei of the leucocytes take on an intensely blue stain. The stain is, however, only serviceable for preparations which are less than a month old. New or old preparations can be easily stained if a 1 per cent. solution of the methylene blue is used, with three grains of the carbonate of sodium in 100 cc.—*Indian Medical Gazette*, January, 1901.

THE CASTOR-OIL PLANT AND MOSQUITOES.—The United States consul at Maracaibo, Mr. Plumacher, writes to the State department as follows concerning a remedy against mosquitoes, which, he says, "consists in planting the castor-oil plant (*Ricinus communis* or *Palma christi*) around the house and premises. In cold and temperate climates the castor-oil plant grows to a height of four or five feet; in these countries it becomes a tall tree, and is perennial. It seems that the smell of the plant is disagreeable to mosquitoes and other insects, and it is an acknowledged fact that where these plants grow few mosquitoes are found. Mr. Plumacher's personal experience bears this out.—*Med. Record*, Jan. 12, 1901.

EXANTHEMATA DUE TO QUININE.—Kristian Grön states that in four cases, in which small doses of quinine were exhibited, erythemata with subsequent desquamation were observed; and in a fifth case a papular rash was seen, with a certain amount of urticaria. In all these cases itching and redness of the skin were marked, and a slight rise of temperature occurred in one case.—*Norsk Magazin für Lægevidenskaben*, Dec., 1900.

[We are without information for what purposes

quinine was given, whether for purely experimental purposes or for the treatment of illness.]

WARRING AGAINST MOSQUITOES IN CUBA.—According to a despatch from Washington, Governor-General Wood has issued an order in Havana which declares that the chief surgeon of the department of Cuba has reported that it is now well established that malaria, yellow fever and filarial infection are transmitted by the bites of mosquitoes. The troops are enjoined to observe carefully two precautions; first, they are to use mosquito bars in all barracks, hospitals and on field service wherever practicable; second, they are to destroy the larvæ by the use of petroleum on the waters where they breed. Pools or puddles are to be filled up. To other collections of water is to be applied one ounce of kerosene to each fifteen square feet of surface twice a month.—*Med. Record*, Jan. 15, 1901.

NEITHER MALARIA NOR ANOPHELES IN BUFFALO, U.S.A.—In the *Buffalo Med. Journal*, November, 1900, Drs. Irving P. Lyon and Alfred B. Wright published their investigations as to the existence of autochthonous malaria in Buffalo and its environs, the result being that, in spite of their collection of mosquitoes, amounting to three hundred and seventy-four specimens, not one of these belonged to the genus *anopheles*, they were all examples of the *culex*. The authors likewise made blood examinations of 28 cases of suspected malaria, with negative results. The authors have therefore come to the conclusion that there is no evidence to prove the presence of malaria in recent years either in or around Buffalo.

CASE OF ÆSTIVO-AUTUMNAL FEVER IN NEW YORK.—Dr. George L. Peabody read a paper in a case of æstivo-autumnal fever at a meeting of the New York Practitioners' Society on December 7, 1900. The patient was a carpenter aged 34, who had lived in New York continuously for eleven years, during which period he had only once left the city, on which occasion he visited Pennsylvania for a few days. Crescents were found in the patient's blood. He was treated with quinine and arsenic with beneficial results. A marked feature in the condition of the patient was that the spleen, although felt to be enlarged during the illness, was perfectly immovable. This was no doubt due to a chronic perisplenitis. With the subsidence of the symptoms the spleen returned to normal dimensions and mobility.

DR. A. G. CIPRIANI has found the following prescription very useful in the treatment of malarial fevers, malarial cachexia, and the other types of malarial disorders:—

R	Eosolic quinine	..	..	} of each 7.5 grains.
	Reduced iron	..	..
	Strychnine sulphate	..	..
	Arsenious acid	..	..	} of each 1.5 grain.
	Extract gentian	..	..
M.	q. s. to make 50 pills.			

Adults should take two pills three times a day at meals. Children from one to two pills a day, according to age.

Dr. Cipriani likewise found these pills efficacious in

chlorosis and anæmia. Eosolic quinine is the neutral quinine salt of trisulphoacetyl creosote.—*Deutsche Medizinal-Zeitung*, December 17, 1900.

QUININE HÆMOGLOBINURIA.—Dr. A. G. Welsford is of opinion that hæmoglobinuria may be produced by several poisons, and quotes arseniuretted hydrogen, potassium chlorate, carbolic acid and quinine as being of the number. Dr. Welsford instances two very interesting cases of hæmoglobinuria, which he considers a very rare disease.

THE MAL-TREATMENT OF MALARIAL FEVERS.—Dr. B. M. Sircar, L.M.S., in the *Indian Medical Gazette* for December, 1900, draws attention to the evil consequences which are apt to follow the injurious practice of exhibiting quinine with an "empiric and heterogeneous combination of febrifuges, purgatives, hæmatics, bitter tonics, &c." "My long experience of malarial fevers in Bengal, extending over a period of nearly forty years, has convinced me of the undeniable fact, that much of the sufferings of the victims of malaria in villages is largely, if not wholly due, to the continued and indiscriminate use of these patent medicines, which in a manner augment and perpetuate the evils. Those who suffer most in this way are generally the poor and ignorant villagers living in rural districts. In their eagerness and anxiety to get rid of the fever, they buy a patent medicine which sells largely in the village, and after using it for three or four days, the fever subsides or altogether disappears, and they are delighted at the wonderful efficacy of the medicine, not knowing what baneful effects will subsequently follow from the poisonous action of iron and other contra-indicated ingredients which they have swallowed along with the quinine, which has checked the fever."

PLAGUE.

PLAGUE IN VLADIVOSTOCK.—The reports of an outbreak of plague at Vladivostock are confirmed. There had been up to January 4 nineteen cases, of which fifteen were fatal. Owing to a recrudescence of plague at Smyrna, a quarantine has been imposed by Turkey and Greece on arrivals from that port.

PLAGUE IN SOUTH AMERICA.—The Government of Cape Colony have issued a proclamation that all the ports on the east coast of South America between the 10th and 40th parallels are infected with plague. It is high time that the condition of the South American ports on the east coast was seriously considered, for we have had many instances of infection in countries having trade relation with them. Unfortunately in the daily press and in the medical journals it was stated that it was the South African instead of the South American ports that were thus designated.

YELLOW FEVER.

YELLOW FEVER IN HAVANA.—In a recent half-yearly report of the Havana Sanitary Department it is stated that, during the latter half of 1900, no Americans had

contracted the disease. Some seventeen persons were under treatment on December 17, and it is interesting to note that they were all Spaniards who had recently arrived in Cuba.

ETIOLOGY OF YELLOW FEVER.—Walter Reed, James Carroll, A. Agramonte and Jesse W. Lazear, from their study of yellow fever, conclude that: (1) The blood taken during life from the general venous circulation, on various days of the disease, in eighteen cases of yellow fever, successively studied, has given negative results as regards the presence of bacillus icteroides. (2) Cultures taken from the blood and organs of eleven yellow fever cadavers have also proved negative as regards the presence of this bacillus. (3) Bacillus icteroides (Sanarelli) stands in no causative relation to yellow fever, but when present should be considered as a secondary invader in this disease. From the second part of their study, they conclude that: (4) The mosquito serves as the intermediate host for the parasite of yellow fever, and it is highly probable that the disease is only propagated through the bite of this insect.—*Phil. Med. Jour.*

MISCELLANEOUS.

CURE OF CONSUMPTION BY SPLENIC VIBRATIONS.—An osteopath in a Western State announced at a recent meeting of his bone-suffering brethren that he had devised a new method of curing tuberculosis, and presumably other bacterial diseases. The method consists in shaking the spleen so as to dislodge a number of phagocytes, which seize upon the specific bacilli and devour them. What the patient does, while his spleen is being vibrated, is not stated.—*Medical Record*, Jan. 12, 1901.

[Disbelievers in quinine may perhaps be inclined to try this novel expedient in malarial fevers.]

ALCOHOL IN FEVERS.—(1) If the tongue becomes dry, discontinue; if moister, the drug is doing good. (2) If the pulse becomes quicker, harm is being done, and the contrary if slower. (3) If the skin becomes moister, the antipyretic effect of alcohol is obtained, and again good is being done. (4) If the breathing becomes easier, continue the drug.—*Indian Medical Record*, Dec. 19, 1900.

ANTIDOTE FOR SNAKE POISON.—Captain R. H. Elliot, I.M.S., who has been carrying out a series of experiments with a view to discovering a proper antidote for snake-poison, delivered an instructive and interesting lecture on this subject a few days ago at Madras. Snakes, he said, manufactured their poison by their salivary glands—the glands which lie alongside the edge of their teeth; and but for the fortunate circumstance that all snakes are provided with a reservoir to secrete the poison, which is carried away down into their alimentary canal, every snake would be poisonous. Sea-snakes do not often bite, but if they did it would be fatal. The vegetable preparations put forward by the natives of this

country as antidotes are useless, as also is the injection of ammonia. The strychnine theory of Professor Muller has also been fully tried, and found to be a failure. The real antidote to snake-poison is antivenene, but unless it is fresh it is not satisfactory. The hope for the future lies in the serum of the snake—in separating from the snake itself the antidote to its own poison. In snake-poison itself, the lecturer added, there is not merely a lethal body, a body that kills, but it is more than possible that, side by side with it, or at all events separable from it by heat and chemical process, there is a remedy which would be compact and which will be found to be very powerful.—*Indian Medical Record*, Dec. 19, 1900.

A LARGE OVARIAN CYST.—In the *British Medical Journal* of January 19, 1901, Dr. T. H. Aquino, of the Gaduy Dispensary, India, gives details of a case of ovarian cyst in which some fourteen or fifteen gallons of fluid must have been present. The tumour had been growing for five years, and tapping was resorted to as the only means of obtaining relief, ovariectomy being out of the question.

DISEASES OF SAMOA.—Dr. Edward M. Blackwell, assistant surgeon U.S.N., discusses in the report of the surgeon-general, U.S.N., the diseases of the Samoan Islands. He says, concerning the maladies which attack the natives of the harbor of Pago-Pago, Tutuila Island, that "the most common of these are bronchial, rheumatic, neuralgic, and digestive troubles. The first three are probably due in great part to the fact that the natives get their clothes wet very often, and allow them to dry upon their bodies. Those who wear least clothes are generally least affected. The digestive troubles are probably due to the character and mode of preparing and eating their food, and to sedentary habits. Blindness in one eye is very common, and it is generally due to ophthalmia in childhood, which has been neglected. The cornea is opaque, and the lens generally bulges forward and adheres to it. As a rule, all the children have a peculiar eruption, which I have been unable to diagnose. It generally spreads over the whole body and limbs. It is macular, papular, vesicular, and pustular in the different stages, and often in the later stages there are large foul ulcers. The natives think it is a necessary disease of childhood, and if it is late in making its appearance they sometimes inoculate the child with virus from the pustules of another child. There appears to be very little constitutional disturbance attendant upon it.

A lady who lives at Faga-Toga has practised considerably among the natives and with very good results. She has had no medical education, except what she has picked up from a United States dispensary, and from surgeons who have visited the harbour. She keeps the commoner drugs, and appears to understand their uses fairly well, and to prescribe them intelligently. I have seen several fractures she has reduced and treated with very good results. Two amputations that she has performed, one of the arm and one of the forearm, have come under my observation, and the results were

very good. She had native assistants, and the only instruments she had were a hand saw and a razor.—*Medical Record*, Dec. 29, 1900.

OTOMYCOSIS IN THE TROPICS.—H. Campbell Highet believes otomycosis, or the growth of fungus in the external auditory meatus, to be rare in temperate climates. All the cases of the writer were in adult Europeans. Children are said to be exempt. The symptoms vary. There may be itching, pain, and discharge. In typical first attacks, the meatus is seen to be filled up with a soft wool-like substance. The disease is readily curable if carefully attended to. As much of the fungus as possible should be removed by a probe and the canals cleansed with warm bichloride of mercury solution. After the fungus has ceased to grow a powder is insufflated consisting of boric acid, bismuth salicylate, and oxide of zinc. The ear should be kept clean and dry as a prophylactic measure.—*Medical Record*, Jan. 5, 1901.

TREATMENT OF MOSQUITO BITES.—M. Manquat recommends for the treatment of the bite of the mosquito usually met with in France, the employment of tincture of iodine, formol, or mentholised eau de Cologne. Applying the tincture of iodine on a brush causes the disappearance of the itching at the end of about ten to twenty minutes. Although the iodine acts much more quickly when it is applied at once, still it does not lose its efficacy when the papules are enveloped and inflamed. Using formol, 5 grammes are taken of a 40 per cent. solution, and mixed with 10 grammes of 90 per cent. alcohol and 10 grammes of water. This is applied in a thin coat and renewed as it evaporates, being careful to discontinue on the appearance of any cauterising effect. This is said to act even more quickly than the iodine. Mentholised eau de Cologne or mentholised alcohol of a 4 or 5 per cent. solution, also soothe the itching.—*British and Colonial Druggist*, January 25, 1901.

EXCHANGES.

Annali di Medicina Navale.
Archiv. für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Medec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Exercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.

Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
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Merck's Archives.
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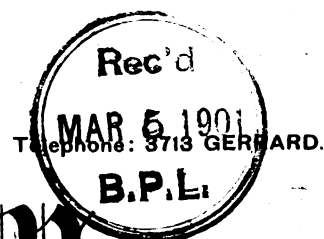
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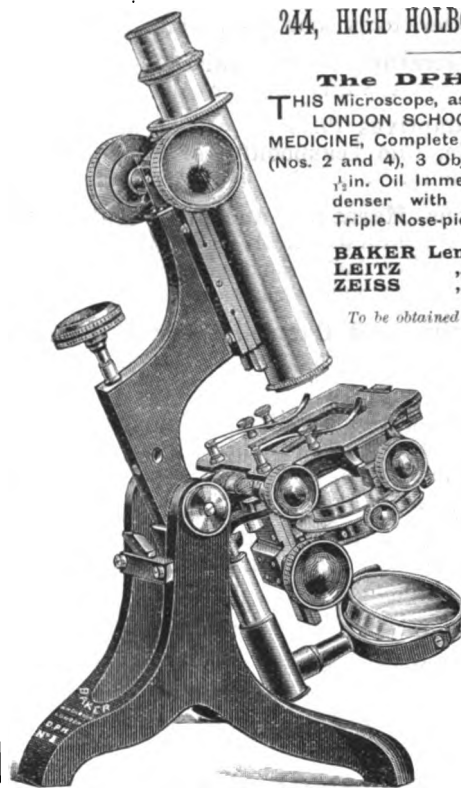
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In order to meet the constant enquiry for addresses of respectable firms catering for the various requirements so difficult to obtain abroad, we give a list of names and addresses which we trust will be found useful to our numerous correspondents and subscribers.

Original Communications.

PINTA.

By P. G. EDGAR, M.B., C.M.

Acting Senior District Surgeon, Perak, Federated Malay States.

THE following case was for the past six weeks constantly under my observation. The details of the case are as follows:—Susannah Tamil, aged 35, married, has had no children, native of Southern India, complains that the skin all over her body is spotted with black and white patches. Soon after her birth her parents emigrated to Burmah. She resided in Rangoon until she was fifteen years old. For the last twenty years she has lived in Perak, Federated Malay States. Her parents are dead. The patient is the younger of two children. Her sister died of "fever" at the age of twenty. There have been no miscarriages. It appears her mother was quite well during her pregnancy, and, as far as I could elicit, she does not seem to have had an accident or fright during the period of gestation. Neither her parents nor her near relatives have, to the best of her recollection, been affected with a similar disease. She has always enjoyed excellent health. She has always had a comfortable home in Burmah and Perak and has been well fed, clothed and looked after. Menstruation commenced at the age of twelve and has been quite regular up to date. There does not appear to be any grounds to suppose that she has either inherited or acquired syphilis. The disease has already continued for thirty-four years, and shows no signs of abatement. The sequence of phenomena are as follows:—When she was about one year old a

single white spot appeared on the right shin. After a time secondary white spots became noticeable in the vicinity of the primitive one and also on the opposite leg. Later on similar white spots made themselves visible on the arms, hands, chest, abdomen and back. Up to her first year, according to her mother, the colour of her skin was of a uniform dark tint. The head was the last part of her body to show signs of the disease; the white patch on her forehead appeared about three years ago. There was never, to the best of her recollection, any fever or pain associated with the appearance of the spots, which have, however, slowly increased in dimension in an executive fashion and gradually merged into one another. The patches have never been irritable. As far as she can remember she has not lost weight. She sleeps well, her appetite is good, and her bowels are regular.

Condition on Examination.—The patient is 5 feet 1 inch in height and weighs 117 lbs. She is a dark complexioned, healthy-looking, intelligent woman. Both buccal and conjunctival mucous membranes show no signs of anæmia. I cannot do better than quote Dr. Manson's words in describing her general appearance: "If extensive areas are involved the effect is often very grotesque, the unhappy victim looking like the painted clown of a circus." Her temperature is normal. There is nothing abnormal to be noted in the circulatory, respiratory, urinary and nervous systems. There is no evidence of lymphatic glandular enlargement. The thyroid body and spleen appear also of normal size.

Integumentary System.—This system presents the most noteworthy changes. The skin, which is naturally dark coloured, is characterised, as will be seen from the photographs, by the association of excess with deficiency of pigmentation. Around the borders

of the leucodermic patches, which are characteristically scalloped, the black pigmentary deposit is most marked, while away from them the melanoderma fades into the normal dark tint of the skin. There is also to be seen in the normal areas of the skin minute melanodermatous spots presenting an appearance as if the skin had been tattooed; this is well seen on the posterior surfaces of both upper arms and in both infra-scapula regions (fig. 2); they do not fade on pressure. The hairs in the leucodermic areas have become white; this is well seen in the anterior and lateral surfaces of the legs (fig. 1). On the face (fig. 1) a white patch is visible on the forehead; it extends upwards and backwards into the scalp, a portion of which has become bald and the hairs have become grey. There are also numerous other leucodermic spots scattered all over the scalp. The mucous membrane of the lower lip shows two distinct white patches (fig. 1).

A most interesting and, perhaps, exceptional feature in this case lies in the occurrence of the disease in the palms. If we direct our attention to figs. 1 and 2, but especially to the latter, we shall notice two leucodermic patches extending inwards on the skin situated over the muscles of the ball of the thumb, and another is distinctly visible in the palm of the left hand, just at the web between the middle and ring fingers. I wish to lay special stress on this point, as its appearance in the palm is unique. As far as I understand, it has never been observed before in the palm. "The palms of the hand and soles of the feet are not attacked" (Manson). "La maladie, jusqu'à présent, n'a jamais été observée à la plante des pieds et à la paume des mains" (J. Brault).

The skin is somewhat dry but pliant, and emits a peculiar odour. It is scaly in the melanodermatous areas, but *bona fide* desquamation can hardly be said to occur in the leucodermic patches.

Cutaneous sensibility to pain, heat, touch and cold is normal all over the body.

The action of the sweat glands is unaffected.

Pathology.—Scrapings were obtained from the skin, moistened with liquor potassae and examined under the microscope. On examining some of the scales with a high power a number of filaments were seen running in all directions. Some of them are of a uniform thickness, others show a tendency to taper at one end. As a rule they take a straight course, but some assume a sinuous direction. In many the threads appear as if they gave off branches, but I cannot be certain on this point. In between the filaments and at their extremities round or oval bodies can be seen. I presume the threads are the mycelial filaments, and the ovoid bodies are the spores of the fungus.

Toutes les variétés de carathés (another name for pinta) sont des aspergilloses de la peau. Il s'agit là, purement et simplement de maladies appartenant au groupe des dermatomycoses qui s'étendent tous les jours. En effet, dans les squames de l'épidermie malade on trouve non seulement un reticulum mycelien, mais encore ce mycelium porte des fructifications très faciles à reconnaître (Brault).

With regard to its botanical position there appears to be a matter of doubt, for as Brault says 'l'étude des

carathés soulève également un problème de botanique: on ne s'entend pas encore d'une façon parfaite sur la détermination mycologique de ces espèces parasitaires. —d'après le professeur Van Thiegher, ces espèces ne peuvent encore être rangées d'une façon définitive. Quelques uns de champignons offrent des caractères intermédiaires entré le groupe de *Aspergillus* et la groupe des *Penicillum*; d'autres, plus dégradés, se rapprocheraient du genre *Monilia*.' *Diagnosis*: Pinta may be distinguished from anæsthetic leprosy by the absence of anæsthesia in the patches; from scleroderma by the absence of rigidity, tension, shrinking and wrinkling of the skin; from ringworm and ichthyosis. *Vide* "Manson's Manual of Tropical Diseases," page 584, first edition.

Remarks.—This extremely interesting, if not absolutely unique case was brought to my notice about two months ago. It is an especially interesting case as it subserves the purpose of demonstrating the existence of pinta in the Old World. So far as I am aware no case has hitherto been reported or described as occurring in the Old World. I note, however, that in Manson's "Tropical Diseases," first edition, he states that "lately a similar disease has been seen in North Africa." The new edition of Manson's work I have not as yet seen. Brault in his recent work says that "la pinta est assez localisée comme domaine géographique elle ne se rencontre en effet que dans le Nouveau Monde et plus spécialement dans l'Amerique centrale: au Mexique dans la Colombie, au Peron."

Less typical cases of pinta than the one described here is not uncommon among the Malays, Chinese, and Tamils in Perak and the Straits Settlements. Among the Malays the disease is known under the name of "Sopah": it is fairly common in the Kuala Kangsar district, in Perak, occurring among several members of the same family. The Malays regard the disease as contagious; they declare it is not unusual for it to spread from husband to wife, or *vice versa*. Although they consider the affection communicable from man to man, they adopt no precautionary measures to prevent it spreading through a household. They appear to have no particular line of treatment for the disease. Manson says pinta is also known as the spotted sickness, *mal de los pintos*, *tina*, *carathes carate*, *cute*, *cativi quirica*.

I have thought the case worthy of notice for the three following reasons:—

(1) The very large extent of cutaneous surface involved.

(2) The existence of the disease in the Old World.

(3) The extension of the disease into the palms.

In conclusion, I have much pleasure in expressing my obligations to Mr. R. P. Colomb, Apothecary, Ipoh Hospital, for his ready and kind assistance in helping me to obtain information about the early history of the case.

REFERENCES TO AUTHORS MENTIONED.

MANSON, "Hygiene and Diseases of Warm Climates," edited by Andrew Davidson, 1893, also "Tropical Diseases," 1898.
J. BRAULT, *Traité pratique des maladies des pays chaudes et tropicaux*, 1900.

CRAW CRAW.

By R. A. BENNETT, M.B.Lond.

Southern Nigeria Government Service.

CONSIDERABLE confusion exists as to the real position which this disease should occupy in dermatology, and it was in the hope of throwing some further light on the subject, that I carried out the investigations, the results of which are given below.

In the *Lancet* for February 20, 1875, there is a description of *craw crawl* by Surgeon O'Neill, R.N., together with a note as to a filaria found in the papules, which he identified with the disease. Below is a short abstract of the paper. "The disease resembles extensive scabies in all its stages of development—papule, vesicle, and pustule; its common distribution is between the clefts of the fingers, on the front of the wrists, and the backs of the elbows; it is accompanied by intense itching. The papules arise singly and at irregular intervals, are firm to the touch, and in four days pass through the vesicular stage and become pustular; to relieve the itching, the patient scratches the part, and, doubtless, infects other regions in this manner. The disease has an incubation period of three days, is very contagious, and sulphur is powerless to check its course. Examination of the vesicle and pustule showed only pus cells, but on shaving off the base of the papilla, and with it the cutis vera, and teasing out the specimens in water, one or more filariæ were found. These filariæ measured $\frac{1}{100}$ by $\frac{1}{2000}$ inch, and had an abruptly pointed tail; at the blunt end or head were seen two small spots, whose significance could not be ascertained."

The name *craw crawl* is given by the ordinary uneducated native of Old Calabar to practically all skin diseases, with the exception perhaps of yaws, which even he regards as distinct from the rest; the more intelligent native, however, divides *craw crawl* into three classes: Leprosy, or bad *craw crawl*; *Tinea circinata*, or Kroo boys' *craw crawl*; and *craw crawl* proper.

Of 83 cases examined among soldiers, prisoners and the ordinary patients at the native hospital dispensary, I excluded 58 as being examples of ordinary *tinea*, leaving 25, which bore a close resemblance to the disease described by O'Neill, and which I believe are to be regarded as cases of *craw crawl* proper.

The disease appears as a papule, which passes through a vesicular stage and becomes pustular in four or five days. The vesicles are characterised by a peculiar discharge, which stiffens linen and dries into yellow crusts, under which the pustules develop. There is some pain on pressure in the immediate neighbourhood of the lesions, but, owing to the colour of the skin, no line of hyperæmia can be made out. I have not noticed the intense itching mentioned by O'Neill, but this may perhaps be explained by the apathy displayed by the local negro, towards a condition which would cause the greatest inconvenience to a more sensitive individual. Still, a certain amount of irritation undoubtedly exists, which is allayed by scratching, and in this way the disease is assured of a continued course which may extend to weeks or months. The disease is markedly contagious and can

be easily inoculated, either upon another part of the patient's body, or upon a healthy individual. Incubation period two to four days.

The distribution of the eruption in my cases did not correspond with that mentioned by O'Neill, as may be seen from the following table:—

Inner side of the thigh	6	Back	...	...	4
Buttocks	...	3	Hands and arms	11	
Legs	...	1			
	10			15	

Presence of filariæ in the papules.—The blood of each patient was examined for filariæ, and the results agreed with the normal proportion of infected individuals in the district. Manson gives this as 63 per cent., and of my cases fourteen were infected—twelve with *filaria perstans*, and two with *F. nocturna*. On examination of the papules, however, the result was negative. In the pustules the ordinary cocci and pus cells were present in abundant quantity, but neither in pustules, vesicles, nor papules did I find filariæ or any trace of them.

It is easy, as Manson points out, to cause a slight hæmorrhage in removing the contents of the papules, and in infected individuals such blood will naturally contain filariæ; if, however, the operation is conducted with care, no hæmorrhage will occur, and the possibility of error is avoided.

Treatment.—This is simple as a rule, though in long standing cases some difficulty may be met with. It may be said that zinc and white precipitate ointments combined with reasonable cleanliness will affect a cure in most cases.

Conclusion.

In addition to O'Neill, two observers are usually quoted in connection with the disease—Silva Araujo in 1877, and Neilly in 1882.

Aranjo describes a case in which this affection was associated with elephantiasis and chyluria. He discovered live filariæ (embryos) and one dead mature worm in the urine, but as he fails to mention whether he found filariæ in the skin lesions or not, his observations do not seem to bear on the subject in question.

It is difficult to understand the second case, that of Neilly, in Brest, where a boy who had never left France was found to be suffering from a skin affection resembling *craw crawl*, in the lesions of which filariæ were found, similar to those described by O'Neill.

It is not impossible that in a seaport crowded with vessels from all parts of the world opportunities for filarial infection exist; and it may be that this case was infected in the ordinary manner, and that the filariæ found merely existed in the blood, which was accidentally tapped during the removal of the papule.

Be this as it may, I fail to see that the case for the filarial origin of *craw crawl* has been proved, and, indeed, I think that the results of my cases tend to opposite conclusions. Further, it seems to me that *craw crawl* is an unfortunate name and unworthy of a place in scientific phraseology. As I have mentioned, it is given by the natives to a great number of skin diseases; and I believe that even for medical

men it serves as a cover for a multitude of perfectly distinct affections.

The idea that *craw craw* should be regarded as a clinical entity, is probably due to the observations first made by O'Neill in 1875, but the disease is common enough, and had his conclusions been correct, they would surely have been confirmed before now, by one or other of the hundreds of medical men who have had opportunities of observing the affection during the past five and twenty years.

This has not been done, and I venture to suggest that *craw craw* as a specific name should be abandoned, and that the disease should be included in the class to which I believe it belongs, viz., pustular eczema.

CASE OF ACUTE CATARRHAL DYSENTERY WITH COMPLICATION OF SYNOVITIS OF KNEE.

By W. G. Ross, M.D.

Seamen's Hospital, Royal Albert Docks.

August 11, 1900.—J. E., aged 20, a native of England, saloon steward, last voyage from Newport News, Virginia, U.S.A., was admitted, under Dr. Manson, at the Branch Seamen's Hospital, Albert Docks, suffering from acute dysentery. Had diarrhoea for ten days; during the last four days noticed blood in his stools—had constant desire to go to stool and tenesmus. His cabin mate had died of dysentery on the voyage.

From August 12th to 21st the patient had a temperature of 100 degrees. There were from forty to twenty stools daily, almost all consisting of blood, mucus and sloughs. All the conditions characteristic of acute dysentery were present. No amœbæ were found at any time in the stools. The disease began to abate after a course of ipecacuanha, the stools being reduced in number to five daily, all faecal without blood or mucus; the temperature fell to normal, and salicylate of bismuth and morphia was administered on the 25th. On the 26th the temperature began to rise, and on the 28th was 100·6 degrees. The patient complained of pain in his right knee which, on examination, was found to be distended with fluid; the patella floated, and the normal outline of the joint was obliterated. There was no redness and not much tenderness on pressure, but pain on movement. The joint was slightly flexed. The temperature, pulse, and state of the tongue indicated an inflammatory condition of the knee-joint. The bowels were more frequently moved, though there was no recurrence of dysentery at any time after the 21st. The leg was put upon a straight back splint with a foot-piece. On September 5th the temperature and pulse became normal, the tongue clean, the stools limited to two daily, and the knee reduced in size, though the patella still floated. On the 17th the splint was removed, the swelling was very slight, and there was no pain on movement. The patient was allowed to get out of bed on the 29th, and made a perfect recovery.

Remarks.—Brault and others have recently called

attention to arthritis as a complication or sequela of dysentery. The foregoing case appears to have been an example of this condition.

PANI GHAO, OR SORE FOOT OF ASSAM, IN BRITISH HONDURAS.

By OSBORNE BROWNE, M.B.

Assistant Colonial Surgeon, Gold Coast, West Africa.

In a letter to the Editors Dr. Browne draws attention to a similarity between what is termed the "ground itch" of British Honduras and the sore foot of Assam, described and illustrated in *THE JOURNAL OF TROPICAL MEDICINE*, for December, 1900. Dr. Browne writes as follows:—

"I have read an article in the December number of the *JOURNAL* on 'Pani Ghao, or Sore Foot of Assam,' and I have to state that it appears to me to be the same, only a worse form of a disease known as 'ground itch,' in British Honduras. This disease occurs in people who walk in mud, and is therefore commonest in wet season. It begins as an intense itching about the toes and between them, and sometimes on the sole or dorsum of the foot. This itching is most intense at night in bed. Then the toes and foot get swollen and red, and vesicles, preceded by papules, form, and much clear serum exudes from them. The condition lasts about a week. The treatment employed by the natives is to apply hot green plantain skins, or hot cloths; in fact, anything hot soothes the itching. Hot lotions are very grateful, but people affected rarely come under medical treatment. This appears to me to be a less severe form of pani ghao, as described in your December issue."

THE ROYAL ARMY MEDICAL CORPS—THE REGIMENTAL SYSTEM.

(Communicated.)

THAT the Royal Army Medical Corps is very unpopular among the young graduates of our medical schools is a fact which hardly requires reiteration. Something is very radically wrong when we read repeatedly in newspapers that not a single civil surgeon in South Africa has accepted a proffered Queen's Commission in the Royal Army Medical Corps.

What, then, are the reasons for such a condition? Most R.A.M.C. men, when questioned on this matter, generally make some grumble about "pay," "leave," &c. None of these are, in the writer's opinion, at the root of the matter.

The unpopularity of the R.A.M.C. dates back to the day when the Regimental Surgeon was abolished and the present Station Hospital System established. I know that the huge majority of present day R.A.M.C. officers simply croak if you breathe such opinions, but it is quite astonishing how many other people more or less connected with the Services agree with this explanation.

In peace times I do not think the Army is looked

after, medically speaking, as it ought to be. To bear out this I may explain shortly the present Station Hospital system. In a station where are garrisoned a cavalry, two infantry regiments and two or three batteries, there will be one Station Hospital into which these units daily dole their sick, higgledy-piggledy. The men of different regiments are not kept apart. All the enteric cases are pushed into one ward—a, to my mind, radically wrong principle of treatment. Medical officers are doubtless detailed to the sanitary charge of the different regimental lines, but as for knowing the regiment—its officers and men—they know, as a rule, little or nothing. To my mind a medical officer is just as essential a part and parcel of a regiment as the adjutant.

To be able to treat and keep in health a body of men like a regiment properly, the doctor ought to live in the regimental lines—if unmarried with the other unmarried officers, in quarters. He should be thoroughly in the confidence of the officer commanding, of the adjutant, and of the sergeant-major. He would in time get to know—and take an interest in—each individual man in the regiment, and moreover he would, I am sure, take an honest pride in not leaving a stone unturned by all means in his power, in order to ensure the health of *his* regiment.

By getting to know the men, and by his communication with the executive officers, he would be able to recognise malingerers, bad characters, &c., not to speak of those who are constantly ill and whose chosen life does not agree with them. There would be plenty of practice, for with the women and children of the regiment he would have some 1,300 people under his charge.

But can the regimental system be reinstated? I say it can, and that too without interfering greatly with the present Station Hospital system, and without interfering with the existence of the R.A.M.C. as a corps.

Every battalion of infantry and every regiment of cavalry should have at least *two* medical officers, and every battery—company of engineers, &c.—one. None of these medical officers should ever be above the rank of major. When a medical officer has reached the rank of lieutenant-colonel—*i.e.*, after twenty years' regimental service—he is fit for the administrative grade, or ought to be.

Every regiment should have its small detention hospital, where the medical officers would see the daily sick, and detain and otherwise dispose of the men who come up. Serious cases of illness and those ill for longer periods than, say, thirty-six hours should be transferred to the Station Hospital. The wards there should be divided among the different regiments—thus we would have the “Devon” ward, the 5th Lancers ward, &c. After seeing his sick in the regimental lines the medical officer would proceed to the Station Hospital, and would there treat his own sick in his own ward, having the benefit of holding consultations on bad cases with his colleagues in other corps.

Every Station Hospital should have also a large and completely equipped laboratory, where every medical officer in the station had a bench, and where research work of every kind could be prosecuted. But this is by the way.

The greater employment of soldier clerks is a very important matter for medical officers, who in these present days are over-burdened with reports and returns—all of which might be safely entrusted to superior clerks.

By allowing the above or more medical officers to units, there would never be any question of “no leave” for study or other purposes.

Besides, in most cases, each regiment would have an unmarried medical officer living at and taking part in the duties of the officers' mess. I am quite certain that were a medical officer thus to live in every British regimental mess, there would be fewer young officers die of enteric than is the case at present.

It will be urged against all this that most medical officers could not afford to live in regiments. A regimental allowance—such as is in vogue in the Indian Army—should be given, and this in addition to the present pay ought to be satisfactory.

I am quite sure that under some such a system as I have roughly sketched plenty of candidates could be obtained. Men would assuredly take a pride in their connection with army units. Personally—and I do not stand alone in this respect—I would far rather be junior surgeon to *my* county regiment than hold any position in the R.A.M.C. as at present constituted.

I have not referred to the Royal Army Medical Corps as a corps. For those who preferred and who have shown special qualifications for the instruction of men in field ambulance, a number of billets could easily be set aside.

I am quite convinced that the reinstitution of the Regimental system on some such basis as I have indicated is the *only way* in which to popularise the medical services of our Army with the medical profession.

VINCIT QUI PATITUR.

PLAGUE IN THE CITY OF BOMBAY.—During the week ending February 12, 922 deaths from plague were reported in Bombay. This is the fifth epidemic of plague in Bombay since it first appeared in 1896; and owing to the later period at which the disease recurred this winter, it was hoped that the virulence of the outbreak was abating; this does not, however, seem to be the case. In the Bombay districts the disease is at present in abeyance. In the Mysore State plague continues to rage. In Calcutta the deaths from plague during the four weeks ending February 9th average between four and ten daily.

PLAGUE IN SOUTH AFRICA.—In Cape Town some thirteen cases of plague have occurred during the past fortnight; only one of the number attacked is a European. The disease is believed to have been imported from South America.

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THE

Journal of Tropical Medicine

FEBRUARY 15, 1901.

THE TEETH OF NATIVES OF THE TROPICS — AN APPEAL FOR INFORMATION.

THE question of our children's teeth in Europe and America is at present occupying so prominent a place in medico-dental circles, that one is induced to go further afield for information. The Teutonic and Latin races have so long lived in juxtaposition that the customs and habits of the two are known to each other and more or less practised in common by both. This is true in the matter of rearing infants, as in many other things, and as the food and general hygiene of the infant shapes the future physical development of the adult, we cannot expect radically diverse opinions or practices in this direction from a study of European peoples only. It is during the first two years of life that the physique of the individual is made or marred; and the

future of the teeth is likewise determined during that period. Many assume, that it is only when the teeth are through the gums that harm can come to them. The public largely assign the decay of teeth to eating sweets and many dentists to a microbic infection. The one is about as true, scientifically, as the other. No microbes will infect the tissue of a healthy tooth any more than they can thrive on other healthy tissues. It is weak or weakened organs that break down under and yield to infective processes and it is the badly nourished tooth during its process of growth and development which decays early. Our dentists concern themselves with the teeth only after they are decayed or misplaced, but the hygienic good to be done then is mere patchwork. As a people, we desire to know why our children fall so early into the dentist's hands; is it feeding? has it to do with food at all? is it habit of life? urbanising of the population, developmental retrocession, or what? Medical practitioners in the tropics (we have unfortunately, few qualified dentists there) can help forward this question. We know already that the teeth of the natives are not perfect, that they get toothache, &c.; we know even that wild animals in their native state suffer from toothache. Caries in teeth is nothing new in the history of mankind, nor even were the arts and mechanisms of the modern dentist unknown in Greek and Roman times. Do not let us mistake the point; the question is, why do the teeth of the children of the present day decay at so *early* an age? It is impossible to raise a healthy race on carious teeth, and unless the whole of mankind are in the same plight, the race whose teeth are good and whose digestion, and therefore physique, is the best, will surely obtain the mastery. There are therefore two or three questions to attend to. First, are the teeth of any of the more primitive races *very good*? if so, can a reason be assigned? Second, are any of the more primitive peoples afflicted with *bad* teeth? if so, can a reason be assigned? Third, *at what age* does decay commence? do the milk teeth decay? does the six-year-old (first) molar decay early, that is, between the seventh

and twelfth years? These are some of the lines on which information might be communicated.

Another pregnant question is the rearing of infants. In Western Europe and America the "unnatural" mother is quite a feature of modern civilisation. She not only insists upon limiting the number of her children, but in most instances refuses to suckle the children she has. Artificial feeding is therefore resorted to; bottles and infant foods are adopted, and the mother escapes the drudgery, as she regards it, of feeding her own child. This is nothing new; feeding-bottles, and therefore artificial food (for even cow's milk is artificial) were known and used in the time of the Romans, and the Etruscan feeding-bottle is a feature in our museums. But the Romans are no more; the Goths, untutored in the devices and tricks of civilisation, overcame them; and such will be the future for all races that cast aside Nature's methods and resort to artificial devices in dealing with the growth of population. The food of the infant and the *means* by which the food is administered, affect the structure of the teeth whilst yet they are beneath the gums.

On these points we can only hope to get information from primitive races, and we look to medical men in the tropics to relate their observations, and to help us to formulate a basis on which to work to prevent the physical (and therefore the mental) decline of the more civilised peoples.

Translation.

THE MICROBE OF PLAGUE.

Distinction of the Bacillus of Yersin from that of Kitasato—Mistake in Kitasato's Investigations—Specificity of Yersin's Bacillus—Kitasato's Opinion on the Specificity of Yersin's Bacillus—Similarity of Kitasato's Bacillus to the Pneumococcus.

By DR. TATSUSABURO YABÉ.

Chief Medical Officer to the Japanese Navy.

(Translated from the French by P. Falcke.)

THE epidemic of bubonic plague in Hong Kong in 1894 forms an epoch in our knowledge of the modern pathology of plague. The Japanese government commissioned Professor Kitasato to make micro-biological investigations, and Professor Aoyama

to devote himself to the study of the clinical and anatomical-pathological aspects of the disease. Dr. Yersin was likewise sent to Hong Kong by order of the French Government for the same purpose.

The two bacteriologists, Kitasato and Yersin, each announced his discovery of a bacillus specific to plague; they were of different species, yet well nigh the entire medical world accepted them as one and the same bacillus under the name of "the bacillus of Kitasato-Yersin."

This acceptance of the respective microbes of Kitasato and Yersin as being the same, caused a certain confusion on account of the difference in the characteristics of two microbes, both described as the bacillus of plague. Other bacteriologists, who successively made investigations in Hong Kong, India, &c., did not deny the pathogenic action of Yersin's bacillus, but made no distinction between the bacilli of Yersin and Kitasato.

Dr. Kitasato stated that the plague bacillus could be stained by Gram's method, and that it coagulated milk, while Yersin's bacillus is not stainable by Gram's method and does not coagulate milk. Kitasato always found his bacillus in the blood of plague patients, but Yersin's bacillus is not found in the blood of sufferers with plague except in serious and septicæmic cases.

Aoyama, in the report of his studies on plague in Hong Kong, differentiates the two bacilli by observing that Yersin's, which is not stainable by Gram's method, predominates in the lymphatic ganglions, while the other one, Kitasato's, which is stainable by Gram's method, predominates in the blood. From this Aoyama concludes that Yersin's bacillus is the specific bacillus of plague, and that Kitasato's bacillus is not the real cause of the disease and is to be regarded as a species of streptococcus.

The investigations conducted on plague at Formosa by two military doctors, Okada and Mourakami, and by Drs. Ogata and Yamakiwa, entirely coincide with and confirm Dr. Yersin's discovery.

In 1896 Kitasato made a report on the plague bacillus, in defence of the specificity of his bacillus. In this report he states that he is convinced of the existence, both of his bacillus and of Yersin's in cases of plague. The microscopical appearance of the two bacilli is utterly different, his being smaller than Yersin's. The reaction of staining by Gram's method is the reverse; Kitasato's bacillus being stainable by this method. Yersin's does not cloud bouillon, and agglomerations cling to the side of the vessel while the liquid remains clear; in Kitasato's the bouillon becomes very opaque. Kitasato's bacillus is mobile, whereas the other is immobile. On gelatine Yersin's bacillus develops on the surface, while Kitasato's grows in the centre of the base. Yersin's bacillus continues to develop on the surface of the gelatine, but Kitasato's stops growing after two or three days if kept in the incubator, and then dries up. It is anaerobic and aerobic, while the other is aerobic only. In experiments on animals in the laboratory there is no great distinction. In the enlarged lymphatic glands of plague patients both bacilli exist, but Kitasato chose to isolate the microbe in the blood, being of opinion that several con-

comitant bacilli must exist in the glands, and that the specific bacillus exists in the blood in its pure state as in the septicæmia of mice and anthrax. Kitasato has also isolated his bacillus from the liver, the spleen, the lungs, the heart, the brain, and the spinal marrow. He believed that plague is a purely septicæmic disease. Thus the bacilli discovered by Kitasato and Yersin respectively are entirely different; they are positively not the same bacillus as is generally supposed, but Kitasato denies that his bacillus belongs to a species of streptococcus as is the opinion of Aoyama. (See "Plague," by Drs. Kitasato and Nakagawa in Stedman's *Twentieth Century Practice of Modern Medical Science*, vol. xv.)

In Japan, likewise, two different bacilli of plague are known, but in Europe only one is recognised—Yersin's—to which, however, the name of Kitasato is applied under the impression that they are the same. Although foreign investigators designate the plague bacillus "Kitasato-Yersin" without exactly knowing the character of Kitasato's bacillus, this name should be abandoned on account of Kitasato's mistake in his investigations in Hong Kong, for the microbe he found was quite different to Yersin's, and the specificity of Yersin's bacillus is acknowledged and confirmed by all bacteriologists.

Kitasato persisted that his bacillus was the specific one until the epidemic of plague which broke out in Kobe in November, 1899. Cases were studied at this time by Kitasato himself and several Japanese bacteriologists. Thanks to these investigations, Kitasato acknowledged that Yersin's bacillus is the specific bacillus. In his last communication* on the plague bacillus, he expresses himself as follows:—"I also observed, when I made my investigations in Hong Kong, that there was a bacillus which was not stainable by Gram's method, but the cases which I examined were all septicæmic ones, and I isolated my bacillus in the blood and lymphatic glands in the belief that the other microbes were secondary. However, in Kobe I had the opportunity of examining plague patients, and in each case I recognised the truth that the bacillus of Yersin was the specific one. In these cases the bacilli, which are not stainable by Gram's method, predominate in the lymphatics in a state of pure culture. In the septicæmic cases my bacillus is likewise present, and to me it appears as if it possessed a special influence in originating septicæmia."

Now the honour of the discovery of the plague bacillus must belong to Yersin alone, and we much regret that so distinguished a bacteriologist as Kitasato should have made so incredible an error in his search for the microbe. Unfortunately he considered plague to be a disease purely septicæmic, and he sought for the microbe mainly in the blood of plague patients who were already far advanced in the septicæmic stage (rather pneumococæmia?) whereas it is not a septicæmic disease, the ordinary type being bubonic plague.

As the bacillus of Kitasato is not identical with that of Yersin, why did foreign scientists not find it in the plague-stricken? This is a question that

defies reply. Aoyama affirms that Kitasato's bacillus is a species of streptococcus, but this bacillus has a plainly visible capsule, and its lanceolate form and other characteristics do not coincide with those of the streptococcus. I have examined the bacillus of Kitasato in his laboratory at Tokio; it is a bacillus that is very similar to the pneumococcus. The co-existence of the latter in plague cases has been confirmed. One can therefore understand that Kitasato's bacillus coincides with the microbe designated pneumococcus by foreign scientists. The capsule, the staff-like form of Kitasato's bacillus, and its reaction to staining by Gram's method, indicates to us that it is a species of the bacillus of Tallamouh-Fraenkel, but which Kitasato formerly regarded as a new species of plague bacillus. This bacillus was often found in the blood of persons in Kobe suffering from plague.—From *Archives de Médecine Navale*, December, 1900.

Malaria.

STUDIES IN RELATION TO MALARIA.

In *The Journal of Hygiene*, vol. i., No. 1, January, 1901, appears two all important articles to the student of Tropical Medicine. The first of these is concerned with "The Geographical Distribution of Anopheles in relation to the former Distribution of Ague in England," and the second is devoted to "The Structure and Biology of Anopheles." If these articles are a type of what we are to expect in the *Journal of Hygiene*, we have to thank the promoters of the periodical for affording a channel of publication to valuable and original work in a congenial setting.

Although ague in England has no immediate bearing on malaria in a tropical environment, still the methods of investigation, the style of argument, and the reasoning to a conclusion are so admirable and applicable that they may well be taken as a type for investigators in every climate. We can only give extracts from these important papers, but we hope the originals will be obtained and carefully studied.

PAPER I.

THE GEOGRAPHICAL DISTRIBUTION OF ANOPHELES IN RELATION TO THE FORMER DISTRIBUTION OF AGUE IN ENGLAND. By Geo. H. F. Nuttall, M.D.; L. Corbett, M.D., F.R.C.S., and T. Strangeways-Pigg, F.R.C.S.

General Observations upon the Geographical Distribution of Anopheles, and their Mode of Dissemination.

Members of the genus *Anopheles* are being found all over the world, and a number of observers are reporting their presence in malarious districts in various countries. In a monograph which will shortly appear from the pen of Mr. F. V. Theobald, some forty-two species or more will be described. Confining ourselves to the three species which are known to occur in England, we find that *Anopheles maculipennis* is by far the most prevalent species in this country and in other parts of Europe, and

* Report on Plague, December, 1899 (*Journal Bacteriologicus Japonais*).



FIG. 1.



FIG. 2.

PINTA.

Illustrating article by P. G. EDGAR, M.B., C.M.

apparently in America. This species has been found in England, Scotland, Wales and Ireland. It has been found in Scandinavia (Zetterstedt), Germany (Meigen, Koch, and one of us), Austria (Schiner), Russia (Gimmerthal), Holland (van der Scheer), Denmark (Meinert), in many parts of Italy and the adjacent islands (Ficalbi, Grassi, &c.), as also in the United States (Howard, &c.), and Canada. *Anopheles bifurcatus*, which is less numerous, has been found in Great Britain, Lapland (Zetterstedt), Russia and Italy (Ficalbi), though it will probably be found elsewhere when searched for. *Anopheles nigripes*, which is the least frequent of these species, is found in Great Britain and Italy, and will doubtless be also found elsewhere.

Methods of Investigation.

In collecting the larvæ of *Anopheles* we have found the following simple apparatus fully sufficient. (1) Some wide-mouthed bottles of medium size with cork stoppers; (2) a white enamelled dipper, which can when required be tied with a piece of twine to a light bamboo rod about four feet long; (3) a small pipette with a rubber bulb; (4) small vials containing dilute alcohol, which is subsequently concentrated, serve for the preservation of larvæ when it is not necessary to keep them alive; (5) the collector should be provided with labels, note-book and pencil.

On expeditions lasting a couple of days it is well to loosen the corks occasionally to give the insects fresh air. The use of the white dipper has the advantage of making it easy to quickly detect the eggs or larvæ upon the white background, the pipette being used for transferring them to the collecting bottles. Only rarely could larvæ be detected by direct inspection of the surface of the water, which in any case is very fatiguing.

Conclusions.

(1) The disappearance of ague from Great Britain does not depend upon the extinction of mosquitoes capable of harbouring the parasites of malaria.

(2) Three species of *Anopheles* (*A. maculipennis*, *A. bifurcatus*, *A. nigripes*) are to be found in Great Britain in all districts which were formerly malarious, but also in places concerning which there is no record of the former prevalence of ague.

(3) The *Anopheles* to-day are most numerous in low-lying land containing many ditches, ponds and slowly flowing water, suitable for their habitat, and corresponding to the districts where ague was formerly prevalent.

(4) Since the disappearance of ague does not depend upon the extinction of *Anopheles* it is probably due to several causes operating together:—

(a) A reduction in the number of these insects consequent upon drainage of the land, this being in accord with all the older authors who attributed the disappearance of ague largely to this cause.

(b) Reduction of the population in infected districts as the result of emigration about the time when ague disappeared from England. This would naturally reduce the number of infected individuals and thus lessen the chance of the *Anopheles* becoming infected.

(c) It is possible that the use of quinine has reduced the chances of infecting the *Anopheles* through check-

ing the development of the parasites in the blood of subjects affected with ague.

Of these, the first-mentioned cause seems to have been chiefly operative. The possibility is not yet excluded of there being another intermediary host besides man capable of harbouring the parasite, and, assuming that this were so, this host may have become extinct in the lowlands where it is known that the fauna and flora have altered.

(5) The coincidence of the geographical distribution of ague and *Anopheles* as claimed by Grassi for Italy, and as probably holding good for other parts of the world, is hereby disproved for England, and consequently the generalisations are proved to be premature whereby he excludes other blood-sucking insects from being possible hosts of malarial parasites on the strength of this supposed geographical agreement.

(6) Since the geographical distribution of *Anopheles* in England is wider than the former distribution of ague in this country, we are forced to conclude that it is not a matter of the geographical distribution of *Anopheles* as much as of their numerical distribution.

(7) Our observations having proved the existence of *Anopheles* in non-malarious districts, we believe that they will explain the occasional occurrence of ague in out of the way places, without making it necessary to assume that malaria-bearing mosquitoes have been freshly imported, for given suitable conditions of temperature and the requisite number of *Anopheles*, a malarious subject coming from other parts might well infect the local insects, which in turn would spread the infection to healthy persons.

(8) We would suggest to those engaged in the investigation of malaria in other countries to search as carefully for *Anopheles* in non-malarious as in malarious regions. More data as to the number of these insects in various localities are certainly required, though we are fully aware that numerical estimates permit of a considerable degree of error. Nevertheless they would always possess a relative value.

PAPER II.

THE STRUCTURE AND BIOLOGY OF ANOPHELES (*Anopheles maculipennis*): THE EGG AND LARVA. By Geo. H. F. Nuttall, M.D., and A. E. Shipley, M.A.

The Ovary of *Anopheles maculipennis*.

When first deposited the eggs are white, but they soon darken. Each ovum measures 0.7 to 1.0 mm. in length, and is at its greatest breadth about 0.16 broad. The egg is boat-shaped and one end is slightly deeper and fuller than the other. The surface which, were the egg a boat, would be the upper is flattened but slightly convex. It is marked by minute reticulations. The under surface of the boat is characterised by much larger and more regular reticulations, which divide the surface into fairly equal hexagonal areas. The rim (a) of the boat is thickened and very regularly ribbed. Along the centre of each side, extending over a space of rather more than one-third the total length, this rim is much thickened, the ribbing is more marked and the whole forms a very conspicuous and characteristic feature of the egg. This thickening recalls the rounded float which runs

along the edge of a life-boat. It serves the same purpose, being composed of air chambers, and is used to keep the boat-shaped egg with its flat surface uppermost. Howard (1900, p. 35) refers to the membrane we are about to describe as the "clasping membrane," notes the reticulated surface exhibited by the eggs, as also the presence of five to seven minute dark circular spots at the ends. His measurement of the egg is given as only 0.57 mm. As in other insects the egg doubtless varies in size.

The colour of the egg soon after it is laid is grayish black. If the eggs are subject to much attrition a delicate membrane splits off which gives the surface of the intact egg its reticulated appearance. Stripped of this membrane, which desquamates in irregular whitish fragments, the egg appears with a glistening black surface comparable to that of patent leather. One end of the egg is slightly blunter and more rounded than the other, and this contains the head end of the embryo. It is an interesting point that when the egg, as frequently happens, is drawn by capillary action a little way up from the water on to a leaf or some other half-submerged object, the head or blunt end always points downwards, and thus should the hatching take place whilst the egg is in this position the larva emerges into the water, and not into the air. We have observed that the eggs floating upon the water slightly indent the surface-film. . . .

The eggs are laid upon water suitable for the development of the larvæ, that is usually water rich in vegetable matter such as algæ. Grassi states that he first found eggs on February 15, 1899. In the spring *A. maculipennis* and *A. pseudopictus* lay their eggs in water about two feet deep, later when the weather grows warmer the eggs are laid in water but a few centimeters deep. On the other hand Grassi (October 4, 1899) says that *A. bifurcatus* lays eggs in cool weather by preference in shallow water, especially such as contains cress. Grassi only found larvæ in the end of March on the Pontine Marshes, their number increasing as summer advanced, whilst they were still encountered in September and October. In November his servant only found one larva of *A. maculipennis* after two days' search in the Campagna.

On the second or third day after oviposition, this depending upon the temperature, the young larva leaves the egg and commences to swim in the water. The egg hatches by means of a circular split near the blunt end of the egg-capsule. This separates a cap-like anterior piece from the rest of the shell. There is no visible ring where the cap breaks off, but the cap is usually more or less of the same size.

CAPTAIN ROGERS' RECENT INVESTIGATION ON MALARIA.

By RONALD ROSS, Major, I.M.S. (Retd.).
Liverpool.

AN abstract of Captain Rogers' recent epidemiological investigations on malaria was published in the *Indian Medical Gazette* for September. It is certainly an interesting paper, though it can scarcely be said to yield reliable conclusions. Captain Rogers examined

the spleens of over 5,000 persons in the districts north of Calcutta and found that the percentage of persons with enlarged spleen was considerably smaller in the riverine villages than further inland, and was also much less in villages supplied with filtered drinking water than in the others. From this he concludes that there is "a very definite relationship between the drinking water and the amount of malaria, as judged by the spleen-rate in this alluvial area."

If these observations are confirmed by much more extensive investigations carried out in various parts of the world, they will tend to show that enlargement of the spleen is favoured by impure drinking water; but they will certainly not, by themselves, prove anything else. The mistake made by Captain Rogers is to suppose that the spleen-test is an accurate measure of the amount of malaria, pure and simple, in a locality. As a matter of fact enlargement of the spleen is a mere syndrome of malaria, which is largely affected by race, for instance, and possibly by other adventitious circumstances—such, let us say, as drinking water. Suppose for argument that this were actually the case, Rogers' conclusion would at once be vitiated. Can he show that it is not actually the case? In considering a question of such difficulty as that whether malaria is produced by other means than by mosquitoes, all possibilities must clearly be taken into account.

Consider some facts, for example. My regiment, the 19th M. I., at Secunderabad, suffered severely from fever in 1897. I used to spend the whole day in hospital studying the cases, and am quite certain of the fact. Yet, on an occasion when I was called upon to examine the spleens of the whole regiment for the purposes of an official report, I was astonished to find that, so far as I remember, not more than half a dozen of the men possessed enlarged spleens. I daresay the report can be still unearthed from the regimental archives—it was dated about August, 1897, I think. In this case then Captain Rogers with his spleen test would have declared the regiment free from malaria.¹ Again, in the Wilberforce barracks at Freetown, Sierra Leone, we actually found parasites in a quarter of the men taken at random. Yet very few of them had enlarged spleen. Indeed in the whole of Freetown, which has a perfect pipe-water supply obtained from mountain sources, there is very little enlarged spleen, though the place is a deadly one. In short, Rogers' researches do nothing more than fall in with a suspicion which many of us have held, that this syndrome is due to *something* plus malaria. I would advise consulting Daniels' careful work on the subject. Then, again, it must always be remembered that the enlarged spleen is an evidence rather of past malaria in the patient than of present malaria—compare, for instance, my *kala-azar* report. Lastly, innumerable instances have shown in many parts of the world (for example Freetown, and towns in Italy—compare Bignami) that malaria is *not* given by drinking water.

Rogers further adduces the admission rates in local dispensaries in favour of his statistics. But surely no one can have faith in such evidence! The popularity of the dispenser—anything—will affect these rates.

¹ The regiment drank unfiltered well-water.

As to comparing them with changes of season, he seems to forget that in localities when almost every one is infected from early childhood, the admissions may depend more on relapses due to wettings during sudden showers and similar causes than to fresh infections. Thus any military surgeon can observe that a route-march immediately brings on fever amongst a number of his soldiers! Does the route-march cause infection? The fact is that owing to the long-continued nature of a malarial infection, its numerous modifications and its relapses due to all kinds of causes, there is no disease in which statistics, epidemiological researches, ground-water estimates and so on are more likely to lead to error, and such are never very satisfactory methods of enquiry. To prove that malaria is carried by any other medium than by mosquitoes, the germs must be found in that medium; or the disease must be actually produced by it under experimental conditions; or both must be done. Nothing else is likely to satisfy experienced pathologists nowadays.

The true test of what Daniels calls the *malariousity* of a place is certainly not the spleen-test, but depends on the average length of time which elapses before an immigrant into the locality contracts the disease. I always warn men against undertaking medical researches; but since Captain Rogers shows so much enthusiasm in this cause he may permit me to suggest a modification which will probably make his investigations more useful. He should examine those commonest of immigrants, the local babies—as has been done with such effect by Koch, Christophers and Stephens (*Royal Society Reports*). He should compare the age of these at which the parasites begin to appear; the age at which they disappear; the corresponding enlargement of spleen; the percentage of local *anopheles* infected; and the conditions of environment. And, if I may make another suggestion, actuals rather than ratios should be given in his statistics, so as to enable the reader himself to judge regarding the value of each observation.

Rogers' finding *anopheles* larvæ in tanks and pools with fish in them is interesting. Evidence on the point is somewhat conflicting; and it is possible that the species of insects concerned may have to do with their habits in this respect. Rogers seems to think that I have laid it down as a law of universal application that *anopheles* never breed in tanks. If he will read my writings more closely he will find that in discussing the bionomics of gnats I have spoken from my own limited experiences only. In India my investigations were not exhaustive; while in Freetown there are hardly any large ponds with fish, and in these there were no larvæ. I know nothing of what may happen in places where I have never been.

The habit of imputing to a writer opinions which he has never expressed and has indeed often disclaimed, and of then demonstrating simultaneously the folly of these opinions and of the writer for holding them, is one to be guarded against. I have really never expressed the "ingenious suggestions," which Captain Rogers seems to think I have, regarding the possibility of exterminating *anopheles* from, let us say, the whole of Bengal! The utmost I ventured to suggest was that it might be possible to exterminate them from

some large towns, cantonments, and plantations, under favourable conditions. So I think it is; but I have always expressly excluded large rural areas from this suggestion. The idea that vast tracts, peopled only with natives, can be freed from any mosquitoes is too silly to require even a disclaimer.

Indian Medical Gazette, Dec., 1900.

A REPLY TO MAJOR ROSS'S CRITICISM.

By LEONARD ROGERS, M.D., M.R.C.P., I.M.S.

MAJOR ROSS does not think the spleen rate is a good test of the amount of malaria; in which opinion he differs from many Indian authorities, such as Dempster, Chevers, Taylor, Dyson, &c., while the observations of the last two observers on the reduction of the spleen rate, as a result of measures to remove water logging produced by the Western Jumna Canal, strongly support their view. As, however, Major Ross admits the possibility of a connection between the spleen rate and impure water being an explanation of the facts I have recorded, the point is of purely theoretical importance, for repeated blood examinations have convinced me that there is a definite relationship between enlarged spleen and the malarial type of anæmia and general ill-health in malarious places, so that if an improved water-supply will remove these, its introduction will have a greater effect on the health of the population than any feasible crusade against the mosquito; and my results retain all their practical importance. Major Ross's regimental experience, which agrees with my own, only confirms the well-known fact that slight fever, which is immediately and efficiently treated, as will be the case in native troops, will much less frequently cause enlargement of the spleen, than repeated relapses or re-infections in the less favourably situated general population.

Major Ross goes on to deprecate comparisons of fever rates with meteorological data, on the ground that admissions may depend more on relapses than on fresh infections—a factor I have myself laid stress on. Here again it may be admitted that the results of such inquiries may be of more practical than theoretical value, for on account of the great difficulty of appreciably reducing new infections in a malarious tract of country by the destruction of the mosquitoes, a study of the conditions which predispose to the frequent and very injurious relapses is of all the more value as indicating the best times for successful prophylactic treatment; while they have the further advantage of being sufficiently simple to be profitably carried out even by such as myself, whom, Major Ross would "warn against undertaking medical researches."

It is to be regretted that Major Ross should have ended an otherwise very fair, if fatherly criticism, by incorrectly stating that I have misquoted his views. If he will read my paper a little more carefully he will see that I was fully aware of his admission, that it is impossible to exterminate the mosquito from large areas, for I wrote: "We may hope with Ross to at least rid towns or small areas of malaria," and again: "The importance of these observations lies in the

impossibility of destroying all the mosquitoes in even very small areas in Bengal, for the thirty tanks mentioned above all lay within an area of one-sixteenth of a square mile," being in fact a very small corner of Calcutta itself.

In kindly tendering me so much excellent advice Major Ross appears to have overlooked the fact that my orders were not to conduct a scientific investigation into the modes of infection in malaria, but to carry out a practical inquiry into the health of a considerable tract of country, while the results obtained still appear to me to strongly suggest, although they do not scientifically prove, that there is "a very definite relationship between the drinking water and the amount of malaria as judged by the spleen rate in this alluvial area."—*Indian Medical Gazette*, December, 1900.

Reviews.

Dr. B. NOCHT. UBER SCORBUT UND BERI-BERI AN BORD HANSA, 1900 (Scrofula and Beri-beri on Board Ship).—In a short but concise article the author, who, as Port Medical Officer, may be considered an authority, discusses the relatively frequent occurrence of many cases of beri-beri on board sailing vessels lately. The author, however, is of opinion that these cases relate not to beri-beri, but to scrofula, and founds his opinion on the following facts:—

(1) All persons affected recovered in a few days after receiving proper treatment and care, with the exception of those who had died on the voyage. In beri-beri convalescence and recovery are a matter of months, sometimes even years.

(2) Only one type of the so-called beri-beri was ever observed on board ship, viz., the dropsical or moist variety, characterised by weakness and swelling of the lower limbs, accompanied by hæmorrhages and swellings of the gums. The so-called "dry form" never came under notice.

These facts are remarkable, and certainly indicate "scrofula" as the diagnosis.

(3) It was only in Punta, Delgada, and Falmouth that the disease was diagnosed as beri-beri.

AN INTRODUCTION TO MATERIA MEDICA FOR INDIA. INCLUDING THE PREPARATIONS OF THE BRITISH PHARMACOPŒIA, 1898. By C. F. Ponder, M.B., C.M., and D. Hooper, F.C.S., F.L.S. Calcutta: Thacker, Spink & Co. 1901. Pp. 356.

This carefully prepared work is destined to be adopted in the medical schools of India and to be in the hands of every practitioner of medicine, British or native, throughout India.

It is no mere compilation, but a systematic and thoughtfully arranged elucidation of Indian medicinal resources, whilst at the same time Pharmacopœial drugs are clearly set forth and described in a readable and easily understood form.

We are so apt to look askance at "native" remedies, and to regard the text-book we learned as students as a testament of therapeutics, that innovations are apt to be disregarded. One is wont to consider the

"British Pharmacopœia as good enough for me," and thereby turn a deaf ear to what the natives have to teach us. As the most distant parts of the world become better known to us, it would be wonderful, indeed, did we not have introduced to our notice new plants for medicinal purposes. Three hundred and fifty of the better known Indian drugs are introduced into this work; several natural orders, unheard of in British pharmacy, are mentioned and the properties of their plants described. Of these orders, Anonaceæ, Nymphœaceæ, Capparidæ, Anacardiaceæ, Passifloreæ, Acanthaceæ, Verbenaceæ, Amaryllidæ, are some of the more important. The action of these Indian non-official drugs is not confined to mere carminative, stomachic, tonic, or such simple virtues; but amongst them are purgatives, astringents, cardiac stimulants, nerve tonics and sedatives, insecticides, germicides, &c. It is noticeable that it is only amongst plants that natives of India search for medicine. No new native chemical drug is mentioned as having originated, in recent years at any rate, in India. Long experience has exploited the world of plants, and chemists have produced from inorganic materials the compounds with which we are familiar and which are being added to daily. The properties of plants has been made known to us chiefly by the dwellers in warm climates, whilst the action of chemical drugs has been enunciated chiefly by chemists. The east has given the one and western civilisation the other, and, as we are employing the chemists' productions in ever increasing numbers, let us not forget that Nature's laboratory has not yet been exhausted, and that the native dweller in warm climates may yet know of drugs as potent as opium and as useful as rhubarb. We commend this book to students of medicine in India; it is carefully and accurately written; it is well printed, handy, and the descriptions of the properties of drugs can be readily followed and understood.

New Preparations, Drugs, &c.

UNDER the name of the Eigon Preparations, a new combination or compound of iodine has been produced in Germany by a Helfenberg firm. The preparations are albuminous compounds of iodine, containing up to 20 per cent. of iodine. The drug may be used as a powder for external application, being another of the many powders introduced to replace iodoform; or it may be given internally as a substitute for iodide of potassium, and for the same purpose. When given internally it is stated not to cause iodism.

CANDIDATES FOR INDIAN MEDICAL SERVICE AND THE R.A.M.C.—At the examination for entrance to these services now being held in London there are thirty-two candidates up for twenty-nine appointments in the Indian Service, and seven candidates for twenty-three places in the R.A.M.C.

Correspondence.

To the Editors of the "Journal of Tropical Medicine."

SIR,—It is an excellent thing that any points connected with the relationship of malaria and mosquitoes should be fully discussed, as otherwise facts of easy explanation cause disbelief.

Sir Francis Winter is mistaken in thinking that places where malaria is common and mosquitoes are rare, have been entirely neglected.

The Shire Highlands in Central Africa are a case in point. Malaria is moderately common, and yet more than half the residents informed me that there were no mosquitoes. Mosquitoes were not troublesome and very few people used nets, but they were there, and nearly all of them in one place, at least, were *Anopheles*, the genus which carries malaria. To one used to looking for them they or their larvæ were readily found. As a matter of fact, unless *anopheles* are fairly numerous they cause little inconvenience; two or three a night would not be noticed by people who were used to more numerous mosquitoes.

In considering the relation between the number of mosquitoes and the amount of malaria, unless the genus of mosquitoes is known, nothing can be said. In many places mosquitoes are more common in the less malarial places, but these mosquitoes are mainly, if not entirely, of a genus and species which does not carry human malaria.

I am, Sirs,

Yours, &c.,

C. W. DANIELS.

London School of Tropical Medicine,
February 2, 1901.

Current Literature.

DYSENTERY.

FOR DYSENTERY.—The following prescription has been used with marked success in the Mandoli Regimental Hospital at Bhurtpoore, in cases of acute dysentery:—

R Quinin. sulphat	...	...	gr. ij.
Pulv. ipecacuanha	...	...	gr. v.
Ammon. chloridi	...	...	gr. x.
Tr. opii	...	...	℥xij.
Aquam, q. s.	...	...	ad 3j.

M. Sig. To be given every four hours.

—*Medical Times and Hospital Gazette*, Feb. 9, 1901.

MALARIA.

METHYLENE BLUE IN MALARIA.—Dr. M. Dunn, of Louisiana, says that in the neighbourhood where he resides filthy ponds and water-holes are found in great abundance, mosquitoes without number make life unbearable, and malaria in its worst form reigns supreme. In the æstivo-autumnal type of malaria, treatment with quinine is generally attended with fatal results. Since he has commenced using methylene blue (medicinal) he considers it a God-send. He says: "There is no remedy yet discovered equal to methylene blue in cutting short malarial fever, and especially malarial hæmaturia; the fever leaves gradually in from seventeen to fifty hours." The author uses

Merck's brand of methylene blue, and is not afraid to use it freely. As a rule he gives a hypodermic of morphine and atropine half an hour prior to the methylene. His favourite formula for the latter is:—

Methylene blue (Merck)	...	2 to 3 grs.
Quinine sulphate	...	2 grs.
Iron carbonate	...	1 gr.
Arsenous acid	...	$\frac{1}{10}$ to $\frac{1}{50}$ gr.

For one capsule. For acute fevers, one capsule every three hours; in chronic forms, malarial, toxæmia, a capsule every four to six hours.

Occasionally the methylene blue irritates the kidneys, or causes nausea and vomiting. For the latter two conditions the author uses either cocaine in $\frac{1}{10}$ gr. doses, or a combination of cocaine, cerium oxalate, and bismuth subnitrate, or benzoic acid or morphine.

KOCH ON MALARIA AND BLACKWATER FEVER.—

Professor Koch has recently made some noteworthy pronouncements on the origin of malaria and the most efficient mode of treatment, which, albeit somewhat belated, will be listened to with great respect. He declared that he was convinced the mosquito acted as the intermediate host of the malarial-fever germ and that the only specific for that complaint was quinine. It is to be regretted, however, that in making this statement he seems to have quite ignored the researches and conclusions of the Italians, Bignami and Celli; and, above all, those of Manson and Ross. To a person who was unacquainted with the subject it would appear that Dr. Koch was propounding original views. However, it must be satisfactory to all concerned, and especially to Ross and Manson, that their work has received the seal of approval from so distinguished an investigator as the German scientist undoubtedly is. Another conclusion reached by Dr. Koch, that quinine is the cause of blackwater fever, has been received not only with scepticism by those physicians who have had experience in tropical diseases, but in the case of many with absolute disbelief. Dr. Manson said a short time ago that Koch's view of the quinine origin of blackwater fever was altogether untenable; that blackwater fever was an intense form of malaria was not borne out by facts—the infection was usually a mild one. He thought the idea that it was due to a special type of malaria parasite, possibly resulting from passing through a special form of mosquito, or that it was a disease *sui generis* as had been held, was not improbable. The *Indian Medical Gazette* of a recent date says that Dr. Nuttall, of Cambridge, some time ago sent to the editor of the *Deutsche medicinische Wochenschrift*, a criticism of Koch's which was refused publication in his absence. The *Indian journal* goes on to say that Professor Koch seems to be regarded in Germany as a sort of medical Kaiser whom to criticise is "*lèse majesté*."—*Medical Record*, January 26, 1901.

PLAGUE.

In the *Zeitschrift für Hygiene*, vol. xxx., p. 359, F. describes a disease which occurs in East Siberia, in the Akscha district. Bacteriological observations are lacking, but the disease appears epidemically in

inhabitants of houses and tents, and simultaneously affects a marmot, the "Tarbagan" (*Arctomys Bobac*) in the dry summer and autumn seasons. The persons and animals affected exhibit buboes in the axillary and inguinal regions, and there is thus reason to come to the conclusion that the disease is plague. Dr. Frank Clemow, in the *JOURNAL OF TROPICAL MEDICINE*, February 1900, p. 169, wrote an article on the connection between the Tarbagan disease and plague.

SAPROL TO COMBAT MOSQUITOES.—The chemical manufactory of Flörsheim on the Main, has brought out a particular preparation of saprol with which to kill the larvæ of insects in pools, &c., by mechanically shutting off the supply of air from them. The price is reasonable, the preparation is free from tar products, but contains a certain quantity of eucalyptus, and has an agreeable odour.

HÆMORRHAGES IN MALARIA.—Dr. Lorenzo Bidoli describes a case of æstivo-autumnal fever of irregular character, and accompanied by hæmorrhages from the stomach and intestines. In view of the undetermined nature of blackwater fever, cases of this nature are interesting. The case reported by Dr. Bidoli recovered under systematic and vigorous dosing with quinine.

THE CLINICAL THERMOMETER AS A GERM CARRIER.—W. J. Conklin sounds a note of warning as to the danger of conveying infection by means of the thermometer. Assuming that the thermometer as well as the scalpel may be a germ carrier, does not the mouth furnish as favourable a medium for the development and growth of bacteria as the open wound? It has been asserted that the ordinary methods of cleaning a thermometer, such, for example, as holding it under the water tap, or wiping it with a damp cloth, are sufficient to rid it of bacteria. From careful measurements he estimates that a degree mark is wide enough to accommodate 100 tubercle bacilli, marching in single file, so to speak. Also, that an area with the length and breadth of one of these marks would furnish room for the lodgement of 280,000 tubercle bacilli. Believing that a clinical thermometer should at all times be sterile, he has for some months carried his thermometer in an ordinary rubber case, filled with a 1 to 500 or 1 to 250 bichloride solution. All that has been necessary to prevent leakage of the solution was a piece of leather packing, but there was gradual shrinkage in amount, as each time the thermometer was withdrawn from the case a small portion of the solution adhered to it, and he found it necessary on this account to renew the solution once in three or four days. It was his custom to rinse the thermometer in a glass of water or under the tap before and after using it. While experimenting for the purpose of proving that a thermometer cleaned in the ordinary way was not necessarily sterile, he had at the same time sought for proof that a thermometer kept constantly immersed in a strong bichloride solution, as described above, was entirely free from micro-organisms. The results of the bacteriological examination of six thermometers by Professor Dodge were as follows: Four had been washed but not sterilised. Micro-organisms of one or another variety were found on each of the four. Two had been washed and then placed in a case containing bichloride solution. No micro-organisms were found in either. Conklin thinks these experiments furnish

conclusive proof that the thermometer may be a germ carrier, if cleaned in the ordinary way; that by means of a very simple and inexpensive device it may be rendered sterile after each use.—*Buf. Med. Jour.*

PRESERVING RUBBER ARTICLES.—Professor Krolikowski has, according to *Merck's Report*, come to the conclusion that the best preservative of rubber materials is to place them in 1 per cent. solution of formaldehyde or chloride of zinc; a concentrated solution of boric acid has also given good results in this direction.

THE JUICES OF LIMES AND LEMONS AS GERMICIDES.—According to the *Indian Planters' Gazette* the juice of limes and lemons are so potent as germicides that by squeezing the juice of one lime or lemon into a glass of water, well high irrespective of source, and which has been neither boiled nor filtered, the water after ten or fifteen minutes is thoroughly disinfected. Experiments with cholera germs in water have been tried, and it is stated that the juices of these fruits are as deadly to cholera germs as the most potent of our chemical disinfectants. This is a most important statement, and one which well deserves careful scientific enquiry, and it may serve to explain the wide use made by the natives, of the lime in many tropical countries. During the cholera mission to Egypt in 1883, several of the medical men, who were sent out from this country, believed that "lemon squash" made really from the fresh limes (not lemons) did good in warding off cholera from themselves. If fruit acids have a potent germicide action, especially against cholera, it is altogether wrong to prohibit the sale of sound fruit in native bazaars, as is so often done.

During the siege of Delhi in 1857, cholera was prevalent amongst the British troops, and fruit was forbidden the camp. Many officers, however, disobeyed the order, and ate freely of every kind of sound fruit they could find, with the result that according to the statements of these officers, the fruit eaters escaped cholera in a larger ratio than those who abstained from it. The question ought to be thoroughly investigated.

YELLOW FEVER.

THE DESTRUCTION OF MOSQUITOES IN HAVANA.—So convinced are the sanitary authorities in Havana of the potency of mosquitoes in spreading yellow fever, that they have appointed some forty sanitary inspectors to deal with the possible breeding pools of mosquitoes in the neighbourhood of the city. Pools which cannot be drained have petroleum poured on to them in order to kill the mosquito larvæ. In houses in which yellow fever exists an attempt is to be made to kill the mosquitoes, so as to prevent them carrying away infection and inoculating other people.

MOSQUITOES AND YELLOW FEVER.—A despatch to *The Sun* from Havana states that a number of inoculation experiments have been made at Marianao, the subjects being American soldiers who voluntarily took the risks involved. Four cases are now under treatment, the patients all being soldiers who were bitten by mosquitoes which had previously bitten persons

suffering with yellow fever. The committee engaged in conducting the experiments has found that a mosquito, after having bitten a person affected by the disease, needs fifteen days before it is able to transmit it. If it bites a non-immune in less than that time he will not develop the disease. The four cases under treatment developed the fever in about three days after being bitten. Five soldiers have been living and sleeping in infected clothes, beds, and bed-clothes for twenty days and have not developed any symptoms.—*Medical Record*, January, 1901.

MISCELLANEOUS.

JAPANESE AMBULANCE ARRANGEMENTS.—A correspondent with the Pekin Relief Column has given valuable information concerning the Japanese ambulance arrangements. In the action at Pei-Tsang the Japanese bore the brunt of the chief attack, and lost somewhat heavily, which afforded the writer "an opportunity of watching the work of their medical department, their methods deserving the highest praise. The wounded were rapidly brought to the dressing stations in ordinary stretchers, and laid upon waterproof sheets. Their wounds were attended to, nourishment was given them, and they were quickly transferred to a temporary hospital established in a house near the river bank, from which they were subsequently taken by boat to Tientsin." The Japanese are undoubtedly a great and rapidly progressive people. They have assimilated all the advantages of the Western civilisation with few of its disadvantages. There is no reason nowadays why the wounded should not be adequately attended to on the field, and the sick taken efficient care of in a campaign. It is largely a question of transport, but as long as the absurdities of red tape prevail, and stores, for example, are allowed to rot upon the quay merely for want of the signature of some particular person authorising their removal; so long as our army is ruled by civilian heads which are hopelessly wooden, so long will procrastination and inefficiency be the rule in the medical department. The Japanese have learnt from us; it now seems that we might with much advantage learn from them. Napoleon once said that the British Army was an army of lions led by jackasses. To repeat this now, would be unfair to the many brave and capable officers who have done much good work in South Africa, but the saying might be paraphrased with especial reference to Pall Mall.—*The Medical Times and Hospital Gazette*, February 2, 1901.

A CASE OF PAROXYSMAL HEMOGLOBINURIA.—W. J. Lamson reports the case. The patient was a man, American, aged 40, who had lived as a child in South America, but had subsequently lived in New York. One day, after a long drive in the cold and being thoroughly chilled, he passed urine deeply coloured with blood. Thereafter he had similar attacks at irregular intervals, and they have continued till the present time, a period of some eight years, always referable apparently to exposure to cold. A typical attack begins about 10 a.m., with a chilly feeling, often

becoming a rigor; cold extremities and cyanosis of fingers, nose, and ears; increase in jaundiced hue, and nausea. He then passes urine of port-wine colour, somewhat more frequently than normally and in greater amount. The chill lasts from one-half to three hours and is succeeded by a feverish sensation. At times an urticarial eruption appears on the dorsum of the hands or on the right cheek; or he may have tender painful areas over the bridge of the nose, around the right orbit, or in the left groin. Normal urine is passed again, sometimes in twenty minutes, often not for several hours, depending on how quickly he becomes thoroughly warm. Between the attacks he feels perfectly well, but is a little anæmic. The blood shows no plasmodia. The urine is normal. There is a double murmur at the base of the heart. No remedial measures have been of any special service. The author gives a general description of the malady, and considers the best therapy to be removal to a climate where the temperature is mild and equable.—*New York Medical Journal*, January 19, 1901.

VENOMOUS SNAKES, THEIR BITES, AND HOW TO TREAT THEM.—Dr. Joseph McFarland, in the *International Medical Magazine*, writes a bright and practical article on "Venomous Snakes, their Bites, and how to treat them." He advises that first of all the circulation of the bitten limb should be at once interrupted in order to prevent the toxin being absorbed into the system. The next step should be free incision and enlargement of the wounds caused by the bite of the snake and vigorous suction to draw out the poison, followed by: "Hypodermic injection of three to six drops of a fresh ten per cent. watery solution of chloride of calcium into about a dozen different areas about the wound." Subsequently hypodermic injections of strychnine should be given to stimulate respiration, and hypodermic injections of Calmette's anti-venene (antivenous serum) should be administered very frequently in doses of from 10 to 20 cc. The last-mentioned remedy is the most urgent, and the author furthermore advises all those whose occupations and travels render them liable to danger from this source, always to carry with them a quantity of snake-venom anti-toxin.

FALSE IPECACUANHA.—Practitioners in the tropics would do well to see that they are using, or that their druggist is supplying them with genuine ipecacuanha. It seems that in addition to the text book notifications of possible adulterations, *The British and Colonial Druggist*, February 1, 1901, states that during January, 1901, a number of balls described as "roots" was being exposed at auction along with the genuine root of the *Cephaelis ipecacuanha*. The roots of the genuine and unofficial plants bear a marked resemblance, the most pronounced difference being the large amount of hair-like rootlets present in the spurious article. The "roots" in question seem to be derived from the *Richardsonia scabra*, a plant which is said to contain no emetine. This may be in itself an advantage; and therapeutists have been advocating ipecacuanha with the emetine removed during recent years. But the spurious root may be deficient in more important elements than emetine and if this is so, and spurious

plants or the non-genuine ipecacuanha is administered, the absence of any remedial action of so-called "ipecacuanha" in many cases of dysentery may be explained.

BLACKWATER FEVER IN PORTUGUESE CENTRAL WEST AFRICA.—Dr. A. Yale Massey, in a letter to the Editor, dated October 22, 1900, mentions that he has met with six cases of blackwater fever at Chisamka, Angola, in Portuguese West Central Africa. Dr. Massey states that he is located 300 miles from the African West Coast, and 400 miles south of the Congo, and as this is a new field of exploitation the observation is of interest. Dr. Massey also states that he has met with the ova of the *Bilharzia hæmatobia*.

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 Archives de Medicine Navale.
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 Australasian Medical Gazette.
 Boletín de Medicina Naval.
 Boston Medical and Surgical Journal.
 Bristol Medico-Chirurgical Journal.
 British and Colonial Druggist.
 British Journal of Dermatology.
 British Medical Journal.
 Climate.
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 Hongkong Telegraph.
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Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.
 La Grèce Médicale.
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 Liverpool Medico-Chirurgical Journal.
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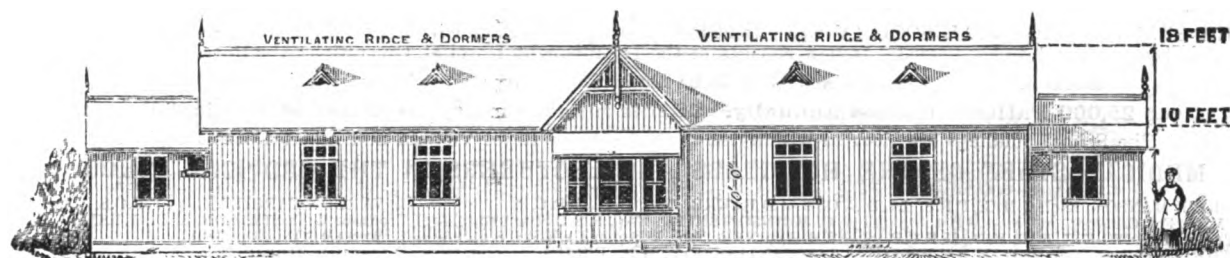
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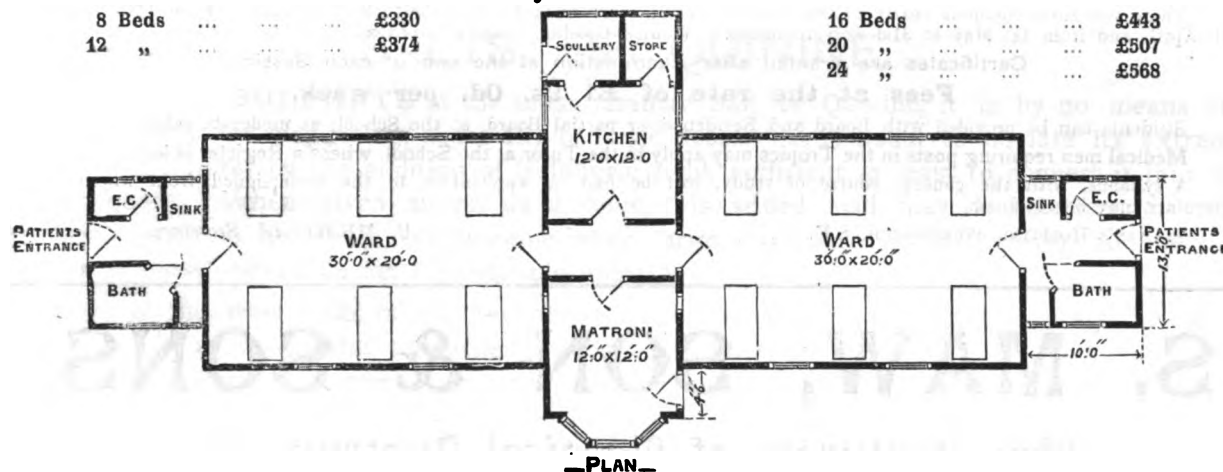


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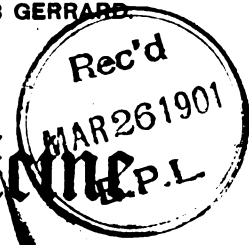
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THE

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A FORTNIGHTLY JOURNAL DEVOTED TO MEDICAL, SURGICAL AND GYNÆCOLOGICAL WORK IN THE TROPICS.

EDITED BY JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D., F.R.C.P.

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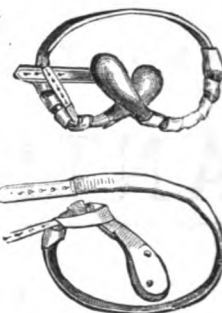
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Original Communications.

OPHTHALMIC NOTES FROM THE TROPICS.

By H. CAMPBELL HIGHET, C.M., M.D., D.P.H.
Physician to the Royal Palace, Bangkok, Siam.

To those medical men who see much eye disease in the tropics, one of the most interesting features of the JOURNAL OF TROPICAL MEDICINE is the attention paid to this subject by Surgeon-Major Yarr and others. Much has already been written on the diseases to which the eye is specially liable in warm climates, but there is still a wide field for research and great need for additional information on many points. With the view of assisting in a slight way in this work, the following notes have been compiled from a record of cases of general diseases of the eyes and appendages seen in private practice either in Singapore or Bangkok.

Starting with *diseases of the conjunctiva*, nothing special need be noted with regard to the ordinary catarrhal conditions, except that they are more frequent at the change of the monsoons and occur equally in all nationalities. Acute catarrhal and acute granular ophthalmia often seem to take a widely spread epidemic character in Siam. Thirty-nine cases of granular ophthalmia were specially noted, the incidence amongst the various nationalities being, Chinese 22, Malays 7, Eurasians 3, Europeans 2, Arabs 2, Jews 1, and others not specified 2. All the usual methods of treatment were tried with varying success and in some of the more obstinate cases excision of the upper palpebral fold, scarification of the granules or expression of their contents with forceps and subsequent application

of sulphate of copper in crystal and even division of the outer canthus, had to be resorted to.

Acute purulent ophthalmia, especially the gonorrhœal form, is fairly common amongst the Chinese. In many of these cases the rapidity of the destructive process is truly appalling. In my hands the most effectual treatment in such cases is as follows: the eyebrows, eyelids and conjunctival sacs are thoroughly disinfected with a solution of bichloride of mercury (1 in 5,000). Great care is taken to clear out any collection of discharge from underneath the lids. This is done by means of a douche and a blunt, flat pointed glass canula. A few drops of a solution of nitrate of silver (gr. x.— $\frac{1}{2}$.) are then dropped into the conjunctival sac, the eyelids are closed, covered with a thin layer of absorbent cotton wool dipped in the bichloride solution. Dry wool is packed over this and the whole is kept firmly in position with a roller bandage.

The dressings are renewed at intervals according to the severity of the case, at first when the purulent discharge is profuse, twice or thrice daily until the intervals can be extended to every day or every other day. By thus closing up the eye, the conjunctival sac is rendered comparatively aseptic at an early stage of the disease, the risk of mixed infection is diminished, rest is afforded to the eye and corneal lesions are often prevented. Where corneal lesions are already present, they heal much more rapidly and leave fewer traces behind. I have never found that the presence of an acute purulent discharge was a barrier to closing up the eye in this manner.

Pterygium may be considered for convenience amongst the diseases of the conjunctiva, notwithstanding the most recent views as to its pathology.

It is a fairly common affection in the tropics, especially amongst seafaring people, and amounted to

3.4 per cent. of the cases of general diseases of the eye.

The treatment has varied according to the nature and severity of the cases. In mild forms, where there are only a few dilated and tortuous vessels in the horizontal meridian with recurring congestion of the surrounding conjunctiva, obliteration of the vessels by means of the actual cautery has often secured excellent results. In the way of after treatment, tinted glasses are prescribed to be worn when exposed to bright sunlight. Circumscribed fleshy pterygia have been dissected away, the spot where it was adherent to the cornea scraped, the edges of the conjunctival gap freed from the sclerotic and stitched together.

In the case of more diffuse fan-like pterygia, I have performed Desmarre's operation of transplantation. The little lump underneath the conjunctiva caused by the presence of the deflected pterygium soon becomes absorbed, and in seven cases operated upon in this fashion, the results have been excellent.

A case of œdema of the conjunctiva will be considered when dealing with malaria and eye disease.

Diseases of the Cornea do not call for much special attention, with the exception of ulcers, in which cases closed dressings have always been applied, and as in gonorrhœal cases, the effect of this method has been most marked. In cases of granular lids with pannus ulcers, the treatment of the lids can be combined with the method of closed dressings, and the result has often been so striking that one is led to believe that the rest afforded to the lids has done as much good to the granular lids as to the cornea.

Diseases of the Eyelids.—Cases of trichiasis and entropion were treated as the case demanded. Division of the outer canthus, displacement, or transplantation of the hair follicles by Arlt's method, and the Streatfield-Snellen operation all gave good results in cases of long standing trachoma in Arabs and Malays.

Two cases of primary syphilitic sore of the eyelids were observed, one in a young male Chinese, the other in a Chinese female, and one case of gumma was also noted. A case of paralytic ptosis in beri-beri will be referred to later.

Diseases of the lachrymal passages have been in my experience totally absent, with the exception of one case of dacryocystitis in a female Eurasian, I have never noted anything approaching trouble of the lachrymal passages in Chinese. This is due, I believe, to the anatomical configuration of the nasal duct and bones in this race.

Diseases of the iris and ciliary region were mainly of a syphilitic nature and will be referred to in discussing syphilis and leprosy, when also diseases of the choroid will be mentioned.

Amongst the *diseases of the retina* there were some interesting cases.

Temporary Partial Scotoma in one Eye.—This was the case of a European male who came to me with the complaint that as he was walking along the street he found that the sight had suddenly become impaired. On examination, there was nothing to observe in the external appearances. The media and internal structures seemed to be perfectly normal, but it was discovered that there was an absolute scotoma

involving the lower and outer quadrant of the field of vision in the right eye. The same thing had occurred some years previously and had passed off quickly, as this attack did in the course of a few hours, without leaving any traces.

Night Blindness.—Three cases were noted. One of these was independent of any condition of the general health, such as fever, the other two occurred in sufferers from malarial cachexia.

Central amblyopia accounted for eight of my cases. Of these, six were traced to tobacco and two to alcohol, and of the latter one occurred in a male and one in a female. The cases of tobacco amblyopia were all adult males and there was no doubt that in most, alcohol helped to bring on the affection. It may be noted as a point of interest that considering the amount of tobacco consumed one may say from experience that tobacco amblyopia is really a rare disease in the tropics. It may be that cigar smoking is not so toxic as the pipe, or the filthy habit of chewing tobacco which so often prevails amongst workingmen in England.

Central scotoma, or "sun blindness." Two cases due to the direct action of sunlight were met with. In one case, that of an officer in a steamship, the blindness came on directly after trying to take an observation in the bright sunlight without having previously shaded the eyepiece of the sextant with the usual smoked glass provided for the purpose. The ophthalmoscopic appearances were negative.

The other case arose in a young Siamese, an eager and clever student of mathematics and astronomy, whose zeal unfortunately led to the development of a central scotoma by observing an eclipse of the sun through lightly tinted glasses. With the ophthalmoscope, there was noted a condition of marked injection of the retinal vessels around the yellow spot which showed up very clearly amidst its deep red surroundings. A month later it was noticed that there was some deposit of pigment around the region of the yellow spot. The visual acuity which had improved from $\frac{2}{80}$ to $\frac{4}{80}$, never improved further.

Without going further into a description of the various regions of the eye affected, it may be more interesting to note the various conditions which seemed to be due to such diseases of the general system as syphilis, malaria, &c.

The syphilitic diseases of the eye show certain peculiar features in these tropical cases. The regions affected were as follows:—cornea 6 cases, sclera (gumma) 1, iris 16, ciliary region 3 (of these two were cases of gumma), choroid (choroiditis 4, chorioretinitis 6), retina and optic nerve (neuro-retinitis 3, atrophy of optic nerve 4), eyelids (primary sore 2, gumma 1).

Special note was made of the early appearance of iritis after the advent of the primary sore amongst native races, in fact in one case, iritis appeared four weeks after the appearance of the sore, which did not heal until the iritis had yielded to mercury. In its severity and after effects, syphilitic iritis, especially amongst natives, appeared to me to be a much more severe disease in the tropics than in temperate climates.

Of course in the two cases of gumma of the ciliary

region, the determination of vision was marked, in one amounting to counting fingers at 2 feet, the other to counting the time on my watch at 14 inches.

In the case of tertiary manifestations in the choroid especially a common history amongst Chinese was that the patient came to have his eyes tested for glasses, presbyopia having manifested itself apparently. The subjective tests failing to give normal vision, ophthalmoscopic examination revealed the presence of patches of choroiditis, often evidently quite recent in character. Upon interrogation the patient was brought to remember that fifteen or twenty years previously he had noticed a small sore, had gone to a European doctor who had given him a bottle of medicine and told him to be sure to continue treatment for a long time, as he was suffering from a "bad disease." The disease had belied its name, however, in his case, as one bottle of medicine had cured the sore and so he troubled no more about it. Such is quite a common history in my experience of the Chinese of the Straits Settlements. There is no doubt that the disease partakes of a mild character in many cases, and the results of specific treatment of these tertiary lesions of the eye were as a rule very satisfactory.

Malarial Affections of the Eye.—The proportion of these cases was 2.2 per cent. A condition which I have not yet seen reported was noted in one case, i.e., oedema of the ocular and palpebral conjunctiva. The following are brief notes of the case:—A wealthy half-caste fleeing from Manila at the outbreak of the rebellion against the Spanish, stopped at Singapore for a few weeks, where he had a slight attack of ague and fever. The morning following the ague, I noted oedema of the ocular and palpebral conjunctiva of the left eye. The patient stated that this was a common sequela of an attack of ague with him. The following day the oedema was practically gone. The visual acuity never suffered during these attacks.

Corneitis of a central superficial nature, amounting to little more than a haziness of the epithelium, was noted in an Arab, after a sharp attack of malarial fever. Corneitis in patches of a superficial type occurred in a European surveyor in Siam, who had suffered much from fever. It passed through a stage of ulceration before recovery. In him, too, optic neuritis was observed in the left eye.

A form of interstitial keratitis has been described by Poncet and Javal as a sequela of malaria. In one case, a Malay, I could not account for the keratitis, unless it were due to malarial poisoning.

Cortical cataract developed in the right eye of a young adult Tamil, without history of traumatism or glycosuria, while recovering from a severe attack of malarial fever contracted in Java.

Retinal hæmorrhage of a flame shape outline was noted in one case after much malarial fever. Two cases of optic neuritis were also noted as malarial, and a marked case of retrobulbar neuritis in a European may be described briefly. The patient was recovering from a very sharp attack of fever, contracted at Batu Pahat, one of the most malarious spots of the Malayan peninsula, and noticed one day that sight in the lower part of the field of vision had become very dim. The following day the upper half

followed suit, and in three days he was stone blind in the affected eye—the left. On ophthalmoscopic examination, two days after the onset of blindness, nothing abnormal could be made out, but a month later, on again looking at the eye, the nerves were noted to be pale and the vessels small and rather empty. The vision never improved, and he died some two months later in the General Hospital at Singapore—the cause of death being certified as pernicious malarial fever, with cerebral and hepatic complications.

Night-blindness occurred in two cases. Both patients had suffered much from malarial fever. In one an ophthalmoscopic examination was made at night time, when dimness of vision was present, and it was noted that the discs and fundi were paler than during the day, the vessels seemed to be somewhat empty and showed pulsation. Glasses did not improve vision. Both cases recovered under the influence of quinine.

Beri-beri.—Amongst hundreds of cases of this disease, I have never seen any special eye conditions except in one only, of which the notes are as follows:—

N. A., aged 17, came to me complaining of oedema of the feet and ankles, of a dead feeling in the feet, of dyspnoea, difficulty in walking, and of oedema of the eyelids. On physical examination, the heart reveals the usual tumbling action of beri-beri, with reduplication of the second sound, especially on the right side. The eyes are normal, with the exception of some slight conjunctival injection with oedema of the lids. Five days later, it was noted that the oedema of the lids had gone, but that there was distinct paralytic ptosis in the left.

Leprotic Affections of the Eye.—In cases of leprosy, it would seem that the chances of the eyes becoming involved, the date of the appearance of the lesions and their type, all depend upon the variety of the disease whether it be the anæsthetic, tubercular or mixed form.

Taking first the purely anæsthetic form, we find that of twenty cases of leprosy in which the exact duration of the disease was known, five cases belonged to this variety. The duration of the symptoms in these five cases ranged from fourteen years to eight months, the average being 4.9 years. Now how were the eyes in these cases? In all five, the eyebrows and eyelashes remained intact, in two there were maculæ on the lids, while in two there was some chronic conjunctival catarrh without any apparent paresis of the lids. In another case, chronic conjunctival catarrh was due to paresis of both lower lids, but without corneal lesion. One of the cases of conjunctival catarrh was accompanied by weakness of the orbicularis in both, not amounting to paralysis, and a peculiar pannus corneitis in each eye. This corneitis took the form of a crescent which involved the upper marginal segment of the cornea. The concave border of the crescent was raised and sharply defined, while the remainder of the cornea was clear.

No other lesions were noted in any of these purely anæsthetic cases.

In the tubercular form, however, we find a more serious state of affairs. Of the twenty-three cases

already mentioned, ten were purely tubercular, the duration ranging from fifteen to four years, the average being 8.9 years.

The supraorbital arches were thickened in 9 of the 10 cases, the eyebrows thinned or lost in 8, and the eyelashes thinned or gone in 8. The eyelids were thickened from deposit of new tissue in 7 cases, and actual leprotic tubercles were evident in one case. In another case it was noted that slight entropion was present in both upper lids without any evidence of trachoma.

(a) Of the conjunctiva, slight chronic catarrh was noted in two cases, but like that noted in the anæsthetic cases was due, I believe, to lowered vitality and confinement and was not actually leprotic in nature. A tubercle of the conjunctiva was noted in one case in one eye at the outer horizontal meridian of the corneo-scleral margin, while in another case, which I shall report more fully, the development and subsequent deep extension of a conjunctival tubercle was well shown. The case was that of a Chinese female aged 17 years, who had suffered from tubercular leprosy for six years. The eyebrows and lashes were gone, and the supraorbital arches were thickened. In the *right* eye, to the outer side of the cornea in the horizontal meridian, is a tubercle involving the conjunctiva, sclera and probably the ciliary body. The adjacent area of the cornea is opaque and so also the adjacent half of the lens. It is remarkable to note the entire absence of anything like inflammatory disturbance of the rest of the edge, for the remainder of the cornea and lens are perfectly clear and the iris unchanged. The aqueous, too, is perfectly clear. Fingers are counted with difficulty. In the *left* eye of the same patient, there is in the upper and outer quadrant of the corneal periphery, a patch of condensation with a few vessels passing to it from the conjunctiva. The corneal condensation passes inwards in advancing lines, as it were, and involves all the layers of the cornea. One week later it was noted that the tubercle in the right had doubled its size, that the lens was wholly opaque and that the iris was hazy and pulled over the tubercle which was apparently growing inwards through the ciliary region. The cornea, too, was nearly all hazy. In the left, the corneal condensation was more advanced and now at the corneal margin a tubercle had formed. The disease had been present already six years in this case. In another case, a Chinese female aged 28 years, suffering already fourteen years from the mixed form, there was noted a greyish tubercle of the conjunctiva on the outer side of the right eye. It was almost non-vascular, with the exception of a few vessels running to it from the adjacent portion of the conjunctiva. The tubercle seems to be entirely in the conjunctiva at present and as in similar cases, a noteworthy feature is the absence of inflammatory disturbance in the adjacent cornea, although the tubercle is quite at its edge. The cornea was affected in some of these cases either primarily or secondary to growths in adjacent portions of the eye. A condition of pannus corneitis was noted in two tubercular cases and took on the same form as I have already described in a case of anæsthetic leprosy. The opacity was in all three cases confined to the upper

part of the cornea, it extended from the corneo-scleral junction in the form of a crescent whose free border was concave and distinctly raised above the surface of the underlying cornea, and was sharply defined, while at the corneal border it shaded gradually away into the conjunctiva. It was totally unlike the pannus condition which one sees in cases of trachoma.

(b) Ulceration of the cornea was observed in a case of mixed leprosy of six years' duration, which presented a tubercle at the edge of the right lower lid, paralysis of the left lower lid and a non-vascular ulcer in the lower segment of the left cornea. The ulcer could only be seen by oblique illumination and was not accompanied by any haziness of the cornea. Primary interstitial keratitis as above reported was seen in one case to precede the development of a tubercle at the outer corneo-scleral margin. The keratitis took the form of fine parallel lines of condensation passing into the cornea from the periphery and involved the deeper layers. These lines had advanced, extended, and coalesced when the case was seen a week later and a tubercle was evident at the corneo-scleral margin.

Such were the primary lesions of the cornea, while of lesions of a secondary type an advancing superficial and deep corneitis was the usual concomitant of progressive lesions in the neighbourhood, such as tubercle of the conjunctiva, iris, or ciliary body. In all these cases, however, the non-vascular nature of the keratitis was a marked feature.

(c) Coming now to conditions of the iris, it was noted in one case, that of a female, aged 28, who had suffered from the mixed form for eighteen years, that repeated attacks of iritis preceded the formation of leprotic tubercles in the iris and ciliary body. In this case the following lesions were noted: tubercles of superciliary arches and lids, eyebrows gone, lashes thinned, both lower lids paralysed; in both, some conjunctivitis and lachrymation; tubercles of a yellowish red colour in the left iris at the outer side close to the ciliary attachment of the iris; a tubercle in the ciliary body at the corneo-scleral border is evidently advancing towards the surface; the cornea and iris are hazy throughout, especially near the tubercles; tension plus. A chronic form of serous iritis with keratitis punctata was observed in a case of anæsthetic leprosy of fifteen years' duration. The case is of considerable interest owing to the good recovery made, and merits rather a more lengthy report than the former cases. A Eurasian lady suffering from a mild form of anæsthetic leprosy had been treated for some years with "hvang-nan" and realgar, by Dr. Galloway, of Singapore. Considerable improvement had taken place and when Dr. Galloway asked me to look at the eyes, the skin troubles were completely quiescent. The condition of the eyes was as follows: Catarrhal conjunctivitis in both eyes of ten days' duration; two small opacities in the deeper layers of the left cornea in its upper and inner quadrant near to the centre. The irides, which are slightly irregular at the pupillary margins, react slowly to light and accommodation, but dilate freely with atropine. By the ophthalmoscope the media are seen to be clear and nothing abnormal is noted. The visual acuity is normal in each. A simple antiseptic lotion was prescribed and the catarrhal

symptoms passed off rapidly. A year later, the following notes were taken: Irides still irregular at pupillary borders; they react more slowly than before to light and accommodation; visual acuity normal; media clear.

Thirteen months later, I was consulted because of dimness of vision which had been noted for six months or so, and noted as follows:—V. A., R., $1\frac{1}{2}$ Sn., V. A., L., 4 Sn.; lens normal; in both, the ocular conjunctiva is slightly oedematous and very pale pink. There is no deep circumcorneal injection. Besides a few spots of opacity in the upper and outer quadrant of the left cornea already noted, there is a ring of pale grey opacity about 1 mm. broad at the periphery of each cornea. In both there is a typical triangular-shaped area of fine dust-like deposit on Descemet's membrane in the lower portion of the cornea. The deposit is of a pale greyish-brown colour. The aqueous is quite clear in each, the irides are swollen, irregular at the margins, and do not act to light or to accommodation. Tension is normal. The palpebral conjunctivæ are healthy. Under the influence of atropine, the pupils dilate slowly but freely, but the borders still remain irregular. The colour of the irides does not seem to have changed since I saw her first. There are no posterior synechiæ but upon the anterior capsule of each lens there is a ring of pigment spots which mark the site of the pupillary margin in each eye when mydriatics have not been used. With the ophthalmoscope the details of the fundus cannot be clearly made out owing to the condition of the cornea and of the anterior capsule and also because of considerable vitreous disturbance as well. There is no ciliary tenderness on palpation.

In the way of treatment, cocaine was employed as a mydriatic to be applied every few days only, and an ointment of yellow oxide of mercury was ordered, with which to massage the cornea twice daily.

The result of treatment was excellent. The corneal and deep opacities gradually cleared up and the visual acuity rose to normal again.

Such a happy termination is said to be rare in leprotic iritis, although according to Bull and Hansen, iritis and irido-choroiditis are more amenable to treatment than corneal affections.

No deep lesions of the eye were noted, although many ophthalmoscopic examinations were made in lepers.

In concluding these notes on leprotic lesions of the eyes, the following are the statistics derived from an inspection of 101 Chinese lepers in whom the duration of the disease could not with certainty be made out.

Suffering from eye lesions	...	...	77
Eyes unaffected	...	...	24
			101
Eyelids and conjunctivæ affected in 67 per cent.			
Corneæ affected in 10 per cent.			

WATER-ITCH; OR, SORE FEET OF COOLIES.

By A. B. DALGETTY, C.M., M.D.

South Sylhet, India.

THE anonymous writer¹ of the article on Pani-ghao, or water-sore, in the Journal for December, 1900, gives a very good clinical picture of a disease which is well-known to all medical officers having charge of tea gardens.

I have devoted a considerable amount of time and trouble to the study of this disease and had the following paper already written and lying beside me when the above article appeared. I therefore give it as it stands, although it covers a good deal of the same ground as that traversed by your anonymous contributor.

The disease might be defined as a superficial vesicular dermatitis, which occurs epidemically among coolies working on tea gardens during the wet months of the year, which solely attacks the feet, and which has considerable resemblance to ordinary scabies.

The native doctor-babus almost universally term it "water-itch" in the districts of Sylhet and Cachar, but they appear to know nothing of its cause. Sometimes they attribute it to pricks from the sensitive plant, *Mimosa pudica*, which grows here and there, and sometimes to very extraordinary causes, such as standing in elephant's urine and the like, but the coolies themselves all believe they catch the disease in those parts of the tea-garden where human excrement has been deposited. Indeed, it is often very difficult to persuade them to go into those places when work requires it, owing partly to the dread of getting sore feet and partly to the filth which lies about.

There is very little attempt at any kind of conservancy on most gardens, because the natives will not adopt it, so that the coolies simply go and squat down in the shelter of the nearest row of tea bushes, and the result is that in a garden with a population of two thousand coolies more or less, after three or four years the ground in the neighbourhood of the coolie huts is thoroughly sodden with ordure and affords an excellent nidus for all kinds of parasites.

This water-itch does not occur in a new garden until a year or two after it is opened out, and it varies in severity in different gardens during the same year, and in the same garden, during different years.

The prevalence of the disease also bears a close relation to the general health of the labourers. In some unhealthy gardens the number incapacitated during some months from this affection alone forms half of the whole sick-list, hence it is of considerable importance to gain some definite knowledge as to the exact nature of the disease.

Symptoms.—The disease itself is a vesicular dermatitis, with some tendency to bullous formation. It begins usually in the soft moist skin in the clefts

[¹The writer of the "anonymous" article referred to, we have reason to believe, was Dr. Elliot, of Assam. The article was, however, not signed, and the usual accompanying letter did not reach us. We should be pleased to hear of, or from, Dr. Elliot, in order that we may publicly acknowledge his able and interesting article.—EDITORS.]

between the toes, spreads upwards over the dorsum of the foot round the instep and outer edge and burrows into the harder skin of the sole. It rarely or never reaches higher up the leg than the ankle—a line drawn horizontally round the leg at the level of the internal malleolus would mark the upper limit of its spread—and it does not attack any other part of the body, not even the hands.

At first there is some burning and itching at the point where the vesicle will form, and two days later a small elevated vesicle can be seen. Several such vesicles appear simultaneously within a short distance of one another, but they are all quite distinct and independent.

The vesicle enlarges in a horizontal direction, becomes tortuous and very often lateral branching cuniculi shoot out from it.

The smarting, burning and itching increase and give great trouble to the sufferer, but as a rule the patient does not scratch much, perhaps owing to the great tenderness which exists.

When once established the disease rapidly spreads, breaking out in new spots all round the foot till the victim can only stump about on the heels, or not at all if both feet are affected at the same time.

If allowed to go on, several neighbouring vesicles may coalesce and there results a bleb which may be as much as half an inch in diameter, especially if it is located along the inner or the outer margin of the foot, where the hard skin of the sole joins the softer skin above.

The vesicles may rupture and allow an opalescent watery fluid to escape, but most of them go on to form pustules. It is rare, however, that a scab or crust is seen like that of ordinary scabies on other parts of the body, and the explanation of this may be that the wet and the friction to which the bare feet of the coolie are constantly exposed prevent a crust having time to form.

If the attack be a severe one swelling of the foot and leg is apt to occur and then a large slough may result, leading to a very troublesome ulcer. As in scabies, the dermatitis reaches down to the Malpighian layer and to the papillæ, blood corpuscles being often obtained in scrapings of the burrows.

The disease, as might be expected, affects chiefly those coolies that are in a weak state of health; anæmia from various causes is very common in many tea-gardens, especially amongst the women, and it is these cases that suffer most severely.

During the wet season the feet of the coolies become bleached and softened through the continual wet. Their work, plucking the tea-leaf, takes them over the ground all sodden with filth; many of them are puffy and œdematous from anæmia, and such people after a long days' work have little energy and often less inclination, to wash their legs thoroughly; hence the personal conditions are all favourable to the invasion of parasites.

The men suffer less frequently; their work is different, they are more robust, and some of them wear shoes. It is the exception to see the disease in a healthy, clean, dark-skinned coolie.

During the period of its prevalence, that is to say, from July to October, the moisture in the ground is at

its greatest, and the temperature in the shade runs from a maximum of 87° F. in July to a minimum of 70° F. in October. After the latter month the disease disappears completely until the next rainy season. The ground dries up and becomes quite hard, so that it does not stick to the feet. The climate suits the coolie better, work is lighter, the anæmia diminishes and the materies morbi seems to lose its vitality.

This water-itch does not attack the natives living in the crofts round about; this may be due to their methods of conservancy being quite different, human filth not being allowed to collect in one area and also because being indigenous they are more robust than the imported coolie.

Ætiology.—So far as I have been able to discover by inquiry of the native doctors, and from medical officers of tea-estates, and through questions in the *Indian Medical Gazette*, nothing is known of the cause of this skin-disease. I have devoted a large portion of the past two years to a study of the problem and the following is the result of that investigation.

Analogy leads one at once to look for a cause similar to that of scabies communis. The location of the disease on the extremities, its tendency to spread, its liability to relapse, the itching that accompanies it, the formation of vesicles and the like, are all suggestive of ordinary itch.

If one of the vesicles be opened and its contents examined under the microscope, various substances will be found. If taken early, before pus has formed, perhaps only a few blood cells, serum, and some grains of sand will be seen. Later, other foreign bodies are found, such as the spores of several moulds—of which *aspergillus glaucus*, *mucor mucedo* and *cladotrix dichotoma* are the chief organisms of suppuration—especially the *staphylococcus pyogenes aureus*, rapidly moving *diplo-bacilli* which are very common in many putrescent fluids, faecal matters and such like, and which would seem to be the swarming rodlets of the *bacillus subtilis*, blood corpuscles, pus cells, particles of sand, fibres of cloth and other extraneous substances.

If care, however, is taken to evacuate the pustule completely and to remove at the same time any crust that may surround the spot, then in a certain percentage of cases one or more greyish, ovoid bodies may be seen lying perhaps under the shelter of a little heap of *débris* (fig. 1).

These elliptical bodies are the ova of an acar. Occasionally one may be fortunate enough, if the microscope is handy, to see a living acar sprawling in the fluid or making off from the field of vision.

The best way to take a specimen is to slit up the tunnel of the vesicle and remove the contents with the spoon end of a director or other small scoop. When the vesicle is pricked, its contents often spurt out a distance of two or three feet, showing that there is great tension within, a fact which may partly account for the itching and discomfort that accompany the disease.

It is easy to overlook the ova in the midst of the *débris*, so in order to make sure whether any are present or not, the specimen should be carefully covered up, laid aside for a day or two and kept

moist by placing a drop of sterilised water on the slide. It is better not to put a cover-glass over the specimen, for if this be done the young acari have hardly room to develop and less air and moisture are obtained.

Life history.—The ovum is ellipsoidal in shape, has a length of $40\ \mu$ and a breadth of $20\ \mu$, is of a greyish hue increasing to a darker shade towards the periphery; its contour in certain positions is not quite symmetrical being somewhat flatter on one side than on the other, its surface is finely pitted (fig. 2, a). After lying dormant for about three days, the egg shows a denser appearance at one end, the yolk separates slightly from the egg-envelope, and in two days more the first signs of the embryo appear as faint lines crossing the centre of the egg (fig. 2, b). The different parts of the embryo soon become differentiated, movements begin to show themselves, and then little time is lost before the young mite kicks off its mantle and walks out as an active six-legged larva.

The empty egg-shell splits up as a rule like a peapod, or sometimes a cap-like piece is pushed off one end and the little pits are now more easily seen as black dots all over the surface (fig. 2, c).

The larva has the general appearance of the adult only it is smaller, has yet only three pairs of legs, and possesses an anal slit but no sexual organs; there is a stout bristle on either side of the body about the point where the missing pair of legs will appear, and the tarsi are furnished with hairs and ambulatory processes as in the adult (fig. 3).

The young acarous does not run about long as a six-footed larva, but after feeding for one or two days settles down into a quiescent state, called by Claparede¹ the "second-ovum stage" and by Megnin² the "nympha."

The legs are gathered a little underneath the body, the larva shows no sign of life, not even when touched, the general appearance of the whole mass becomes hazy and indistinct, and swells up into an ellipsoidal form like the original ovum. After a rest of two or three days the change is complete, the young mite frees itself from the old skeleton and comes forth as a four-legged individual.

This moulting-process is a true rejuvenescence, the new acarous being formed within the body of the old, whose empty structure is left lying in the field: it is not merely a casting of a skin like a snake, for the developing members can be seen lying across the creature's body through the old transparent skeleton.

There are still, however, some adult characters wanting. The body is smaller, the bristles, especially those on the extremity of the abdomen, are shorter, and the sexual organs, in the female at least, are undeveloped.

The male has reached its final evolution, being possessed of a complete sexual apparatus. But both male and female are pubescent and it is now that impregnation is effected, for although the female still lacks the true vagina, that organ is not yet necessary, since fecundation is brought about by means of the ano-vulval slit.

Copulation, which I have witnessed, takes place in the following peculiar manner.

The dorsal aspect of both mites is directed upwards, that is towards the observer, and the two heads away from each other, so that the under surface of the abdomen of the male covers the upper surface of the abdomen of the female. The male fixes himself there by means of two suckers situated on either side of his anal-slit, and overlaps the female to about one-fifth of her length. In this position the sexual organ of the male, which lies forward between the hindmost pair of legs, corresponds with the vulvo-anal slit of the female, which lies at the extreme posterior border of the abdomen. The female, which is the larger and stronger, may be seen dragging the male about in this attitude (fig. 4).

When fecundation has occurred the ovigerous female rapidly develops a true vulva through which the ova, which very quickly form, are deposited. This vulva is situated between the hindmost pair of legs, just as in the male, but from its peculiar position it would seem to be inaccessible to the male, at any rate coition takes place through the vulvo-anal slit as described.

General characters of adult.—The body is ellipsoidal, slightly narrower towards the anterior extremity, convex in both directions above, flat antero-posteriorly and convex laterally below, of a glass-grey colour, skin easily ruptured.

Rostrum of medium length, conical, no cheeks, legs long, five jointed, all seen outside margin of body, end-piece furnished with simple ambulatory pedicle; male provided with two copulatory suckers; no abdominal lobes present. The profile of the mite, especially that of the snout, resembles on a small scale the profile of the ordinary field-mole.

The colour of the body when empty is a glassy-grey, but if the stomach is full of half digested food, it gives the impression of a greenish-yellow tint, merging into a greenish-brown in the rostrum and limbs and where the body is covered by the skeletal plates.

Anatomy.—The rostrum is composed of a chin supporting a horse-shoe-shaped maxilla, to which two unsegmented palpi are hinged.

These palpi end in blunt nose-like processes and carry a short stout hair near the extremity.

In the space between the palpi, lie the two incurved sickle-shaped mandibles which are not serrated, and which, when at rest, are covered for the greater part of their length by the labium. Outside the rostrum on either side and springing from the groove that marks the cephalo-thorax arises a strong plumose bristle, which curves inwards and forwards as far as the tip of the corresponding maxillary palp. This bristle would seem to take the place of the so-called "cheeks" in other species (Megnin, *op. cit.*).

No organs of vision can be detected. A few faint lines run round at the junction of the head and thorax, and the triangular sternum runs down in front.

Immediately outside the sternum the epimera of the first pair of legs can be seen at the point of their attachment to the body. The two anterior pairs of legs arise near together, close to the root of the neck; they are similar in size and are furnished with similar appendages.

Midway between the anterior and posterior groups

of legs two fairly long bristles project, one from either side of the body (fig. 5).

More posteriorly the two hinder pairs of legs take their origin, much nearer to the middle line of the body than in the case of the anterior group.

All the legs of this group are also similar to one another, but they differ in some respects from those of the anterior group. These differences will be mentioned afterwards.

The convexity of the abdomen is furnished with fourteen long hairs, some of which spring from the dorsal and some from the ventral aspect (fig. 7).

In the middle line from before backwards the following parts can be made out: a faintly defined gullet leading down into the general body-cavity in which numerous droplets of half-digested food float about; the sexual organ, male or female, lying between the posterior pair of legs; more posteriorly the anal-slit, furnished in the male with two suckers, in the female with only three short hairs on either side. Towards the outer margins of the body, and hidden by the attachments of the posterior pair of legs, two kidney-shaped bodies, which are probably concerned with excretion (fig. 7, ex); near the anal-slit, a round dark movable body which can be expelled by a little pressure and is really a lump of excreme; and finally in the ovigerous female an ovum may be seen in the vicinity of the vulva.

No respiratory apparatus can be detected.

Digestive system.—No definite organs seem to exist for the purpose of digestion, but very often a rounded, yellowish ball may be seen lying in the body-cavity between the anterior and posterior groups of legs (fig. 5). Movements take place in this substance, and newly-ingested particles appear to go first to this spot, and after a short stay are set free to float as small oily drops in the general body cavity (cf. Berlese⁸.) The refuse collects in the posterior part of the abdomen, and is voided as the little greenish-brown pellet before mentioned (fig. 5).

Sexual organs.—The adult male acarus has a length of 0.18 mm., and a breadth of 0.08 mm.

The sexual apparatus has a triangular shape, being formed of two lateral plates hinged together anteriorly and furnished on either side with two goblet-like suckers, besides one or two short bristles. These plates diverge posteriorly to enclose a lipped cavity, which contains a circular object, no doubt the penis. No signs of any kind of testis can be seen (fig. 5).

A short way behind the penis lies the anus, bounded by four short hairs and the two suckers, which are so necessary during copulation (fig. 5).

The adult female acarus has a length of 0.20 mm., and a breadth of 0.09 mm.

The true vulva, which, as before noticed, is not concerned with impregnation, lies in the same position as the male generative organ, from which it does not differ very much in general appearance (fig. 5).

Two tailed plates meet in the middle line, leaving a triangular space between them in the depth of which it is difficult to make out any definite structures. Round the margin are four short hairs but no suckers.

The anal-slit in the female lies at the extreme end of the abdomen, a position which the peculiarity of the act of copulation renders necessary. It is provided with six short hairs, but has no suckers.

Appendages.—Numerous hairs and bristles, in addition to those mentioned in special places, are found on the dorsal and ventral surfaces and attached to the leg segments.

The outline of the acarus, when seen from the dorsal aspect, is much more regular than when seen from the ventral aspect, owing to the attachments of the legs being concealed beneath the body.

Five pairs of strong hairs, or bristles, are usually found on the dorsal surface; one pair projects over the snout, a second pair arises at the junction of the cephalo-thorax, a third, fourth and fifth pair are attached more posteriorly. All the longer hairs on the body are plumose (fig. 7).

The legs are composed of five articles, the first being covered at its juncture with the body by the epimeron.

The first, second and third articles carry each a short, stout bristle; the fourth has one short and one very long bristle, and in addition to these, in the angle between the long bristle and the leg, a prominent finger-like process projects. When the fifth article becomes over-flexed, this process as well as the long bristle being situated on the convexity of the joint, come into contact with the surface upon which the acarus is walking.

On the extreme end of the tarsus there is a nodular pad or caruncle which possesses a sucker-like action during locomotion, while on the outer edge of the tarsal extremity are a few short hairs and a curved unsegmented, finger-like hook which is constantly flexed and extended during the act of walking. When the mite dies this process is retracted and lies along the margin of the circular end-piece of the leg (fig. 6).

The two posterior pairs of legs are slightly more slender than those of the anterior group, but otherwise, except in one particular, they are exactly the same. The exception is that the finger-like process at the root of the long bristle on the fourth article is absent. This distinction holds good in every case.

The foregoing description of the anatomy of this acarus would seem to place it among the *Rhizoglyphineæ*, and it might be called the *Rhizoglyphus parasiticus*, none of the latter sub-species having hitherto been found as human parasites.

Specimens can be kept alive for many weeks, so long as animal matter, such as blood-corpuscles, pus, faecal matter, gelatin and the like, are supplied. It is the more active the warmer the temperature is.

It may be looked upon as a rhizoglyphus mite living on decaying animal substances at the surface of the ground, and only accidentally becoming parasitic on man in certain favourable circumstances. Repeated attempts to discover the mite in its natural habitat in external nature have, however, been unsuccessful.

Only once a four-legged mite, not unlike the young form of the acarus in question, was found in a sample of mould contaminated with faecal matter. But owing to its being surrounded with particles of sand and earth it was not possible to examine the specimen with a power greater than a quarter-inch objective, so that the details of the mite could not be made out (fig. 8).

As before mentioned, the disease is not present in young tea-gardens till several years have elapsed, a fact which goes to support the idea that it is not until

the ground has become saturated with animal refuse, especially human excrement, and not until the bushes have grown tall enough to keep the sun's heat from drying up the ground too rapidly, that the acarus finds suitable pabulum upon which to live.

As to the means by which a place first becomes infected, it is not improbable that dung-beetles, which are very abundant here, may be instrumental in doing so, as the following discovery will show. Four of these beetles had been kept in a bottle for two days, and in the greenish discharge which they voided was found a living *Dochmius duodenalis*, the young form of the human intestinal parasite, the *Anchylostoma duodenale*, which abounds amongst the coolies in most tea-gardens (fig. 9).

The beetles most likely had ingested the ovum, which become hatched when expelled from the intestine, for only the ova are evacuated from the human host, unless after drastic doses of thymol.

If the dung-beetle can convey the ovum or the embryo of an intestinal parasite from place to place, it may equally well carry those of an acarus from an infected to a non-infected area.

Whether the disease is contagious between person and person it is difficult to say; it certainly spreads quickly from point to point on the foot of the individual affected, and it relapses again and again.

Other vesiculo-bullous skin diseases bearing some likeness to water-itch are: Craw-craw (Davidson's Trop. Dis.), Bullous Disease of Hands and Feet (Hutchinson), *Cheirpomphyl* (Hutchinson), *Stomatitis Epizootica* (Siegel), and Foot and Mouth Disease in Man (Allbutt). Megnin⁴ also in the *Bulletin de L'Academie de Medecine* for August, 1897, describes an arachnid, which sets up an acute inflammatory oedema of the arms and hands, but this is caused by the ingestion of the young spiders that adhere to the shoots of l'Aroche (*Atriplex*).

The present disease differs from some of the above in that only the feet are affected, and from others in that the mouth is never attacked.

Ordinary scabies, due to the *Sarcoptes hominis*, is extremely common amongst Indian coolies; but its distribution, except that it is less common on the feet, its behaviour and its ætiology are identical with those of the same disease in Europe.

Treatment.—The treatment would be fairly satisfactory were it not that re-infection is so common whenever the victim returns to work in the dirty parts of the garden.

The application of a strong solution of lime and sulphur is a good means of cutting short the malady; strong phenyle lotion is also beneficial, and a coating of coal-tar acts for a time as a prevention against infection; but when once the vesicles have formed pustules are sure to follow, and then the only remedy is to slit them up, evacuate the pus and thoroughly disinfect them.

It might be thought that some change could be effected in the habits of the coolies as regards conservancy, but this is next to utterly impossible.

One plan, however, which promises good results, has been adopted on one garden at my suggestion, namely, the wearing of closely-fitting shoes, with the front part reaching high up on the back of the foot,

so that no part of the skin will come into contact with the ground. These shoes are put on when the labourers are working in the foul parts of the garden near the coolie-lines, and then laid aside till again required.

Postscript.—Since the above was written the feasibility and the value of wearing shoes as a prevention against the disease, have been completely proved.

The reason that coolies do not wear shoes as a rule is the very potent one that they cannot afford to pay the price. Any caste prejudice, which they may have against wearing shoes being very superficial, is easily overcome, especially when they see that that it is to their own interest and advantage to do so; but it is the stock argument of the theoretical objector, usually an unwilling manager, to say that the coolie objects to do this or do that when it is a question of a little extra expense in the medical department.

I can speak more highly also of coal-tar, both as a preventive and as a curative agent.

The rod-like crystals mentioned by your correspondent as being found occasionally in the discharge from the vesicles, I have also seen, but as they appeared only when the preparation had been treated with gentian violet I looked upon their presence as an artifact.

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- ⁴ Megnin (M.P.), *Bullet. de l'Academ. de Medecine*, August, 1897. Also generally—Article, "Arachnida," in *Ency. Britannica*, and Fleming's *Transactions of Neumann's Parasites and Parasitic Diseases*. London, 1892.

SOME FURTHER WORK ON THE MOSQUITO-MALARIA THEORY, WITH SPECIAL REFERENCE TO CONDITIONS AROUND NEW YORK. By Dr. William N. Berkeley.—Of the three species of *Anopheles* native to North America, the author has found two around New York: *Anopheles quadrimaculatus* (Wiedemann) and *Anopheles punctiformis* (Say). The anopheles were found always in buildings, oftenest on the walls and ceilings of recently used bedrooms, and far more abundantly in the foul and ill-ventilated bedrooms of the poor. The house females were usually gorged with blood, and sluggish enough to be easily caught. The author believes that the Health Department should require malarial cases to be reported. "It is at least as dangerous as scarlet fever, and far more of a scourge. An inspector should be sent to every infected house to instruct the people to kill all the anopheles in the house, to provide the doors and windows with screens, to isolate the patient with particular care from mosquitoes, and to cause all the standing water in the vicinity to be drained or heavily petrolised." The author believes that, by these measures, the number of local cases could be reduced by more than 90 per cent. in a year or two. The work of the Italians in this connection is referred to.—*Medical Record*, January 26, 1901.

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THE

Journal of Tropical Medicine

MARCH 1, 1901.

IMPORTANT NOTICE.

BRITISH CONGRESS ON TUBERCULOSIS.

This Congress, which is to be held in the Queen's Hall, Langham Place, in the week beginning July 22, has arranged, amongst other matters, for three public addresses to be delivered in the Large Hall, on Tuesday, Wednesday and Thursday of that week. The first will be given by Professor Robert Koch, discoverer of the tubercle bacillus; the second by Professor Brouardel, of Paris; and the third by Professor McFadyean, of the Royal Veterinary College.

CLIMATIC ANÆMIA IN SOUTHERN ENGLAND.

WE are so apt to regard anæmia in the tropics as a result of malaria that it comes as a surprise to many to be reminded that climate may play a part, a large part, in causing the condition; in fact, that it may be the important factor in its production.

A few years ago the Medical Chirurgical

Society of London appointed a committee to thoroughly enquire into the climatic and balneological conditions of Southern England, and more especially of its health resorts. In this report frequent attention is drawn by several observers to the anæmic appearance of the dwellers in towns along the south west coast, in the Channel, and in the Scilly, Islands. In Cornwall, also, on the northern and part of the eastern coasts, and even at Penzance, an anæmic condition of the inhabitants was observed. But this unfavourable state of health extends into Devonshire and even into the damp climate of Dartmoor. These are facts well known to medical practitioners in the districts indicated, and the anæmia of their patients is an ever present factor to be remembered in ailments of every description. Many attribute the anæmia to the proximity of the sea and are content to term the condition one of "marine cachexia." Others, such as Dr. F. Bagshawe,¹ F.R.C.P., of St. Leonards, are inclined to ascribe the disorder to "dampness and relaxing condition."

The districts indicated, however, by no means comprehend all the "anæmic area." Along the low lying valley of the Thames, Dr. Collier, of Oxford, draws attention to the prevalent anæmia met with there, and many observers testify to the endemic anæmia which has its area in the Thames basin. Yet again in the fen districts of Cambridge and Lincolnshire "we get a heavier percentage of anæmia than anywhere else in England" (Bagshawe), and away in Derbyshire even "a similar experience of frequency comes from the valley of the Derwent at Derby."

Those who are interested in this question, would do well to peruse carefully the report of the committee appointed by the Royal Medical Chirurgical Society, and to study closely the article on "The Geographical Distribution of Anopheles (mosquitoes) in relation to the former distribution of ague in England," in the *Journal of Hygiene*, Vol. I. The study of these observations is of extreme interest. Practically, it would

¹ See Presidential Address on "Points in the Development of Seaside Towns," by Dr. Bagshawe, *The Journal of Balneology and Climatology*, January, 1901.

appear, that where ague prevailed formerly, anæmia prevails to-day, and the bearing of the one ailment to the other, gives food for reflection. The anæmia in Southern England is not due to malaria at the present day, so far as we know; yet although malaria has disappeared, anæmia remains. It may not, however, be the case, that the anæmia in each instance has a common origin. One factor is common to both the southern area and the fen districts, namely, excess of moisture in the air. In the former region it is carried in the south west wind which sweeps along with the gulf stream and breaks on the Scilly Islands, the Cornwall and Devon coasts and hills, and along the Channel ports. In the fen counties, on the other hand, the moisture emanates from the soil, and the stronger winds are easterly for the most part. In both cases the wind is off the sea and there may be an element of "marine cachexia" in each but it is more likely due to mere excess of moisture in the atmosphere, independent of any "marine" influence. The condition of the air, especially when the temperature is fairly high, as along the southern shore, maintains a "Turkish bath" atmosphere, causing muscular relaxation, cardiac and stomachic incompetency and other conditions conducive to the anæmic state.

All this bears very directly upon "tropical anæmia." From a study of anæmia in England, it would appear that climate brings about this condition independently of malaria infection, and yet anæmia prevails where malaria once held sway. There is therefore justification for the term "tropical anæmia" apart from "malarial cachexia," and the two conditions although frequently, in fact mostly, combined, may exist independently. Several questions at once arise in connection with this subject. Are persons rendered anæmic by purely climatic influences more liable to contract malaria? Is the anæmia in the southern districts of England and in the fen districts, but a legacy from malarial ancestors; and is there hope of its disappearing altogether as the race continues from generation to generation, whilst the ban of malaria has been removed?

Translation.

A NEW CONTRIBUTION TO THE KNOWLEDGE OF AINNUM.¹

By JUAÑO MOREIRA.

(Abridged and translated by P. Falcke.)

THE repeated statement of Zambaco Pascha, the specialist on leprosy, that ainnum and leprosy are identical, justifies the publication of this article. It may also prove of interest to pathologists to hear of comparative investigations as to the appearances of the diseases in varying climates, and in different human races.

Clarke, in 1860, described ainnum as "a dry gangrene of the little toe, occurring in the natives of the Gold Coast."

Dr. Da Silva Lima, in 1867, wrote an article in the *Gazeta Medica da Bahia*, in which he, by preference, uses the African designation of the disease, which he learned from the Nagôs, African negroes—"Ai-nhum" with the inflexion on the first syllable, the meaning being "to saw." Other African negroes, the Iljês, call the disease "Guduram." The designation "quijila" (an abbreviation of a Portuguese word signifying horror) should not be used as a synonym of ainnum, as it doubtless applies to lepra mutilans of the fingers.

A French naval surgeon, Dr. A. Collas (*Archives de Méd. Navale*, 1867), described the disease as occurring in Pondicherry, in Indians of the Tamil tribe, and gave the disease the name of "Exérèse spontanée."

GEOGRAPHICAL DISTRIBUTION.

It is a matter of difficulty to be able to fix the exact geographical distribution of ainnum, owing to the fact that many doctors confuse this affection with other illnesses.

South America.—Nearly all the cases originate from the towns Bahia, Rio de Janeiro, Pernambuco, and Buenos Ayres; this I was able to confirm personally. I never observed ainnum in the aborigines, and Dr. Da Silva Lima reports one only, which he treated in the Charity Hospital in Bahia. At the basis of the fourth toe there was a semi-circular "tightening-in," similar to that which is seen in African negroes in the first stage of the disease.

In Bahia, cases which were very frequent forty years ago are becoming more scarce, partly because there are fewer negroes of African origin, and partly because their offspring, born in Brazil, are less predisposed to the disease; personally I have seen only nineteen cases during a practice of twelve years, and I have never seen a case in the mixed races. Dr. Da Silva Lima is correct, however, in saying that "more cases would be met with if those afflicted came to the doctors for treatment instead of going to their companions or compatriots to have the diseased limb amputated." The affected part also is frequently removed by tying round with a string, or even cutting off with a razor.

In Rio de Janeiro the affection has been confirmed by Moncorvo de Figueiredo, Pereira Guimaraes and

¹ From *Monatshefte für Praktische Dermatologie*.

others, but at the present time its occurrence is very rare.

In Pernambuco I saw one case, and in Buenos Ayres cases of *ainhum* have been observed by Drs. Pirovani and Coni. In Georgetown, British Guiana, von Winckler observed twenty cases.

North America.—*Ainhum* has been observed in North Carolina by Hornaday and Pitman; it has also been seen in Philadelphia and Canada in negroes from North Carolina. Dr. J. Evans reports a case in Darlington, South Carolina, in a negro aged 74 years. The disease likewise occurs in Louisiana and West Virginia, and one case has been observed in Washington. The rarity of cases, however, may be accounted for in the same way as in Brazil, that is to say, by persons, removing, or having removed by his companions, the diseased member, which is frequently only connected by shreds of tissue with the foot.

Cases have been observed in Trinidad, West Indies, and also in St. Thomas and Havana.

Coast of Africa.—The disease has been observed on the West Coast, and the negroes of the Kroom races are most prone to it. It also occurs in South Africa, and most frequently amongst the Kaffirs. Moreover, cases are known to exist on the Gold Coast.

The disease has been seen on Nossi-bé, an island on the north-west Coast of Madagascar, where the natives know it by the name of "Faddiditi." Moreover, cases have been seen in Réunion, Algiers, Cairo, and Suez.

Asia.—British doctors in India have demonstrated that in this part of India, at all events, there is no immunity. It exists in Dacca, Calcutta, Bombay, and other southern provinces of India. One case was reported in Goa, and some in Pondicherry, as mentioned above. It cannot, however, be said that the disease is common in India, as Crawford reports that of 2,500 surgical cases in hospital, one only appeared to be *ainhum*. The complaint is known in Ceylon, and one case is reported from China.

Oceania.—The presence of the disease has been frequently confirmed in Polynesia.

Europe.—The cases observed in Europe have been imported or their diagnosis doubtful.

SYMPTOMS.

Ainhum first exhibits itself as an incomplete circular shallow, tightening-in, or groove on the inner and lower surface of the base of a toe, close to the fold between the toe and the sole of the foot. At the groove the skin is thickened, or indurated, but at this stage there is neither inflammation nor actual pain. The mobility of the part is not affected, but later it may be seen that the toe (if the little toe be the one affected) is gradually separating itself from its neighbour at the root. The distal end, simultaneously, is apt to bend inwards. Gradually the groove extends round the whole circumference of the upper and outer part of the toe till a complete circle is formed. Then the toe swells and has the appearance as if it were tied round by a fine thread. There is occasional, but not constant, pain. The groove and contiguous surfaces are tender on being touched. When the tightening ring is complete the groove, formerly shallow, becomes a deep narrow fissure, appearing as if a wire were deeply sunk in the tissues.

This slow but progressive strangulation of the toes reaches such a pitch that the toe finally is simply connected with the foot by a short narrow pedicle, which can only be seen by separating the edges of the furrow, on the base of which ulcerative processes or scabs may be seen; in the former case, when the foot has not been washed for some time, the split is moistened by a foetid, purulent fluid. In the vicinity of the wound the skin becomes more tense, and the distal end of the toe becomes twice or three times its normal size. The nail undergoes but little change. In the final stage of the disease the toe can be moved from side to side, or may be turned on its own axis. At this period the first phalanx corresponding to the furrow has quite disappeared, and pain is very severe, especially when the toe is moved. Many patients pad the furrow with thread, or a bit of wadding or a strip of rag, in order to obviate the movement of the toe and to prevent it touching the ground.

LOCALISATION.

At the time of the publication of his first article (1867) Da Silva Lima had only seen the little toe, one or both, affected, but in 1880 he saw cases in which the fourth toe was the seat of the lesion, and this fact has been confirmed by many observers in various countries.

It is said that there are other seats of the disease (fingers, arms, legs), but in these the diagnosis is not incontestable. Personally I have only twice seen the ailment on any part other than the little toe. It is generally affirmed that the deepest spot, where the strangulating tightening sets in, is at a joint, but this does not always follow, as seems proved by the preponderance of cases in which the digito-plantar fold is attacked. Eyles states that in his cases the seat of the tightening was through the middle of the first phalanx.

CASES.

Case 1.—L. C. P., African negro, aged 55, came to me for treatment in 1895. No hereditary history of *ainhum* or leprosy. Formerly patient was always in good health. He asserts he never had any venereal disease, and there are no traces of former syphilis.

Present state: Patient is of medium height and strongly built. The usual examination revealed a moderate degree of arterial sclerosis, otherwise negative condition, with the exception of the little toe of the right foot. He was examined with particular care for nervous disorders and leprosy, but with negative results. There were no changes in the motor and sensory functions, nor in the reflex apparatus. Muscular sense intact.

The little toe on the right foot was enlarged and had the appearance of a small round potato. It was connected to the foot by a narrow pedicle, which seemed to consist of skin and connective tissue. Twenty-five years previously the patient had observed a furrow between the toe and the sole of the foot, this gradually became greater and caused great pain, the toe meanwhile increasing in size.

The nail was still extant, but small, furrowed, and dry. The other toes exhibited nothing abnormal. Sensory disorders were not extant. Patient had been in the habit of going bare-footed, and had often

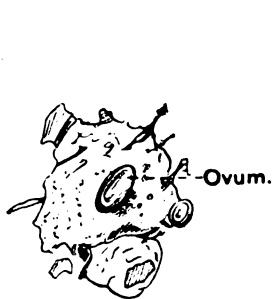


FIG. 1.—Ovum, fungi, spores, particles of sand, &c.

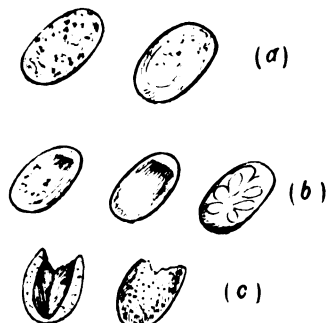


FIG. 2.

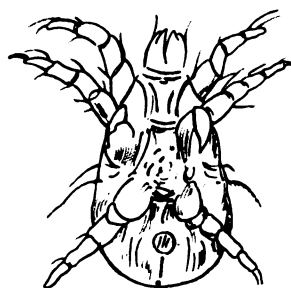


FIG. 3.—Ventral aspect

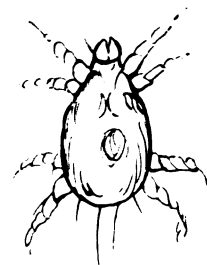


FIG. 8.

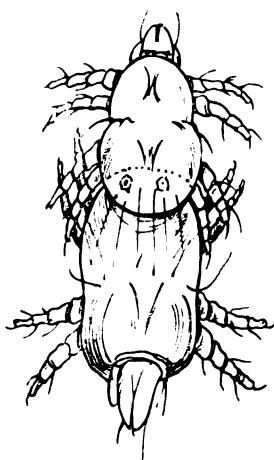
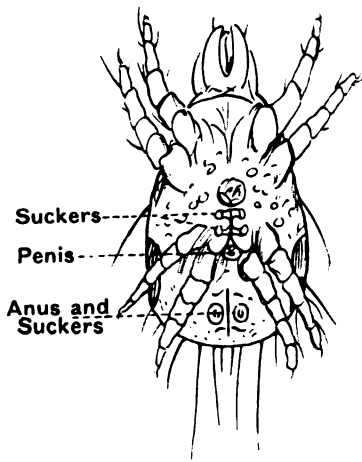


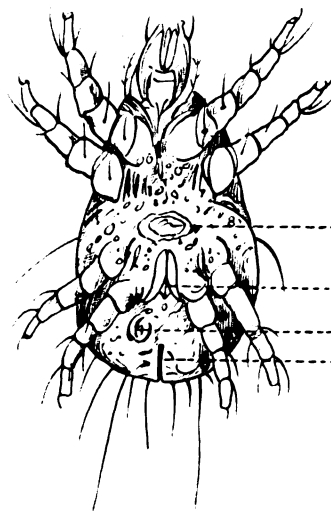
FIG. 4.

Male

Female



Male.



Female.

FIG. 5.

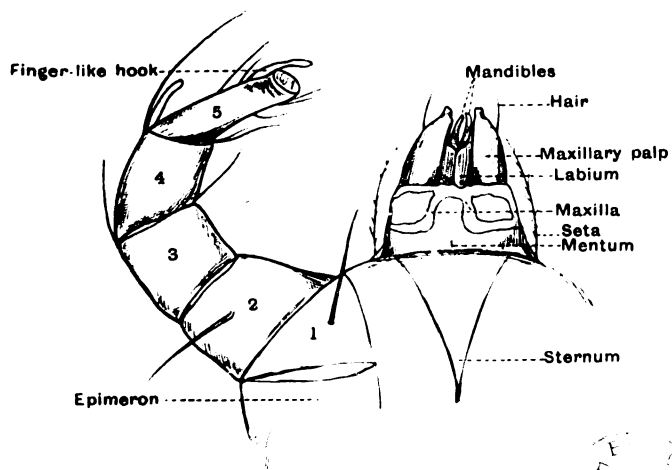


FIG. 6.

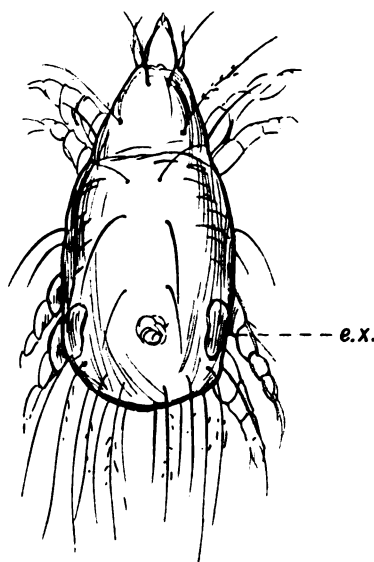


FIG. 7.—Dorsal aspect.

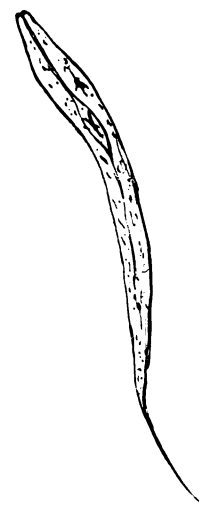


FIG. 9.—Doehmius duodenalis.

Plate illustrating Dr. A. B. DALGETTY'S Article on "Water Itch; or, Sore Feet of Coolies in Assam."

See page 73, March 1, 1901.

Fig. 1.—Ovum, with debris, &c. Fig. 2.—(a) Ovum finely pitted; (b) Ovum showing striae; (c) Empty egg-shell. Fig. 3.—The Larva. Fig. 4.—Copulation. Fig. 5.—Ventral aspects of adult insects. Fig. 6.—Head and leg of acarid. Fig. 7.—Dorsal aspect e.x., kidney-shaped bodies. Fig. 8.—Mite found in soil. Fig. 9.—Young of anchylostoma duodenale.

Bale and Danielsson, Ltd., London.

had the diseased toe injured. I amputated the toe at the metatarso-phalangeal articulation, as I wished to examine the groove.

Case 2.—J. H., African negro, aged 48, consulted me in 1892; had always been a strong, healthy man, had no hereditary tendency to leprosy or ainhum. Had never had a venereal disease, and showed no traces of syphilis.

Present state: Patient is a well-built man. The usual examination yielded a negative result, except in regard to the two little toes. Special attention was directed to finding symptoms which might point to leprosy or nervous disorders, but without result. The perceptions of pressure, touch, pain, and temperature were normal except in the diseased toes, which were enlarged and looked like small round potatoes. I measured the circumference of both little toes, the figures being as follows: circumference at the base of the fissure: right toe $4\frac{1}{2}$ cm., left toe 4 cm.; circumference of the distal phalanx: right toe 8 cm., left toe $7\frac{1}{2}$ cm. At first there had only been a small groove, which gradually increased, tightening in the toe more and more, as if it were tied up with a thread. For many months the patient had suffered much pain, especially when the toes were moved.

As the sensibility of the toes was well maintained, I decided to make deep incisions at a right angle to the direction of the fissure as advised by Da Silva Lima. The little operation was successful as regards the toe of the left foot, but the toe of the right foot had to be amputated after several months.

DIAGNOSIS.

The diagnosis of fully developed ainhum is very easy, I will, therefore, only touch upon the confusion of this disease with leprosy.

Many French observers assert that ainhum is a leprosy affection, but Dr. Zambaco's Pascha's erroneous views are the most difficult to combat, on account of his accurate knowledge of leprosy. On perusing Zambaco's articles, however, it becomes clear that his arguments are based on the doubtful reports of doctors who lacked knowledge of both diseases. Dr. Adolph Lutz of St. Paulo, Brazil, protests against the opinion that "ainhum is but a form of *lepra mutilans*" and so does Da Silva Lima.

Lepra anæsthetica attacks both sexes equally, ainhum mostly males. Leprosy occurs in all races, but ainhum is limited to African negroes and their pure descendants. Leprosy shows no predisposition for a certain toe, or simultaneously attacks fingers and toes; indeed *lepra mutilans* never limits itself to one toe. Ainhum, on the other hand, is always seen in Brazil, on the little toe and more rarely on the fourth toe.

The following symptoms characteristic of leprosy or "Gafeira" in its various stages are never observed in ainhum.—disorders of sensibility, atrophy of muscles, gangrenous ulcerations, formation of blisters, necrosis, atrophy and persistent contraction of the fingers; on the other hand, the constant fissure at the surface of the digito-plantar fold of the foot so characteristic in ainhum is never seen in leprosy.

It is possible to cure ainhum in its early stages by means of incisions in the skin at a right angle to the

direction of the tightening ring, as has been done times out of number by myself and others; this is utterly impossible in leprosy, the utmost the surgeon is able to accomplish being the acceleration of the separation of the part; he can mutilate the patient, he cannot cure the disease.

I have never seen ainhum and leprosy occurring together in the same person.

ÆTIOLOGICAL FACTORS.

The African race is specially predisposed to this illness; they are very flat-footed and in consequence the flexor tendons of the two small toes are obliquely placed.

Men are far more subject to the disorder than women, being more exposed to wounds and injuries. Carriers of burdens are most subject.

No age affords immunity against the disease, but the affection is seen most often in persons of 30 years and upwards.

Traumatic causes are incontestable. Injuries, such as a bruise against a stone, have frequently been asserted as the first cause.

Many authors deny that customs, accident, or work play a part in the ætiology, but I have never observed the disorder in persons in favourable conditions of life.

COURSE AND DURATION.

The course of ainhum is always a gradual and protracted one. Between the time of the first tightening in and the development of the deep ring-formed fissure, with destruction of the phalanx, a period of from two to ten years may elapse. The case observed by Dr. J. Evans in Darlington, South Carolina, subsisted for fifty years. The longest duration amongst my cases was fifteen years.

PROGNOSIS.

Ainhum is a purely local affection, and without effect on the general health or life of the patient. Nevertheless in the later stages there are pains when walking, and a certain diminution of movement. Early treatment by incising the surrounding ring will save the toe by relieving the pressure exercised on the tissues.

PATHOLOGICAL ANATOMY.

Most of the researches as to the pathological anatomy in Bahia and other places were undertaken on toes amputated in a very advanced stage of the disease. Dr. Unna, the celebrated dermatologist, applied the newest method of histological technique for the examination of sections, which were stained as follows:—

(a) Polychrome, methylene blue, glycerine-ether mixture.

(1) The section is to be placed in Unna's polychrome methylene blue solution for from two to five minutes; (2) rinsed in water; (3) discoloured in a glycerine-ether mixture (Grübler's) for five minutes; (4) rinsed in water; (5) absolute alcohol, oil of bergamot, balsam.

(b) Methylene blue—orcein.

(1) Stain in Unna's polychrome methylene blue solution for ten minutes; (2) rinse in water; (3) discolour and drain in $\frac{1}{4}$ per cent. spirituous, neutral solution of orcein, ten minutes.

In order to discover if the bacillus of leprosy was present the sections were stained as follows:—

(1) Wash, and stain in; (2) carbol fuchsin, half an hour or longer; (3) wash; (4) nitric acid (33 per cent.), twelve seconds; (5) alcohol (80 per cent.). Rinse well.

HISTOPATHOLOGY OF THE TOE.

The epidermis shows considerable hypertrophy of all the strata. The stratum granulosum is broadened. The stratum spinosum is permeated by spiral sweat glands of a normal appearance. The cutis propria is formed of fairly thick, closely-placed bundles of fibres and a net of delicate elastic tissues, which exhibit roundish vacuoles between the meshes, through which the dilated blood vessels run surrounded by cells. As a whole the cellular infiltration has the character of chronic inflammation limited to the true cutis and the vicinity of the epidermis.

The dilatation of the blood-vessels only relates to the large veins of the hypodermis, the cutis, and the venous capillaries.

The shrunken bone of the last phalanx in the centre of the toe shows the symptoms of rarefying osteitis. Round the bone, inside and outside the periosteum, there are many cells.

HISTOPATHOLOGY OF THE FURROW OF THE TOE.

The changes undergone by the skin at the site of the strangulating furrow is summarised thus: the stratum spinosum, the papillary bodies, and the upper stratum of the cutis, rich in cells, become considerably reduced. The corneous layer, in almost unchanged thickness, advances deeply into the base of the furrow, where a compression of the same takes place, and many corneous cells crumble away on account of the folding of the entire layer at the base of the fissure. Deeply, at the bottom of the furrow, the hard, dry, fibrous tissue, mixed with cells, extends to the bone.

The histological investigation as regards bacteria was negative. Only a few cocci had penetrated to the base of the fissure inside the corneous stratum. No bacilli of leprosy were visible in any part of the toe.

I am of opinion that ainhum is primarily a hyperæmia of the skin, induced by a disturbance of co-ordination in the arterial and venous circulation. This view is strengthened by the darker colouring of the integument, the decrease in temperature, and the increased perspiration. The digito-plantar fold, being the locality of the normal flexion of the toes, is the original site of this chronic inflammation, in consequence of the continual movements. The inflammation, which continues, becomes gradually ring-shaped, and as the furrow becomes deeper, every movement conduces to the enlargement of the extensor and flexor folds of the toes; whereby the fibrous process of degeneration at the tightening-in spot receives a further impetus, and the tighter the ring the greater the disorders of circulation at the distal end of the toe, with consecutive stasis, œdema and hypertrophy of the strata of the skin.

THERAPEUTICS.

The treatment of ainhum has always been purely local. The various local measures, such as com-

presses, poultices, salves, cauteries, &c., have proved useless.

In the first stage of the disorder the above mentioned treatment of deep incisions at a right angle to the direction of the fissure with the separation of the entire tightening ring is the correct one and this method, which is recommended by Dr. Da Silva Lima proves that ainhum is curable.

In the later stage, when the fissure has become very deep, amputation, or disarticulation at the metatarso-phalangeal joint, must be undertaken.

In concluding this article I must tender my sincere thanks to Dr. Unna for his valuable advice, and for the deep interest he has taken in this work.

We are indebted to Major Ronald Ross, Liverpool School of Tropical Medicine, for the following information:—

YELLOW FEVER.

By HERBERT E. DURHAM AND (THE LATE) WALTER MYERS.

ABSTRACT OF INTERIM REPORT ON YELLOW FEVER BY THE YELLOW FEVER COMMISSION OF THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE.¹

(1) Sufficient search reveals the presence of a fine small bacillus in the organs of all fatal cases of yellow fever. We have found it in each of the fourteen cadavers examined for the purpose. In diameter the bacillus somewhat recalls that of the influenza bacillus; seen in the tissues it is about 4 μ in length.

(2) This bacillus has been found in kidney, in spleen, in mesenteric, portal and axillary lymphatic glands etc., taken from yellow fever cadavers directly after death. In the contents of the lower intestine apparently the same bacillus is found, often in extraordinary² preponderance over other micro-organisms. Preparations of the pieces of "mucus," which are usually, if not always, present in yellow fever stools, at times may almost present the appearance of "pure culture."

(3) Preparations of the organs usually fail to show the presence of any other bacteria, whose absence is confirmed by the usual sterility of cultivation experiments.

(4) It is probable that this same bacillus has been met with, but not recognised by three other observers. Dr. Sternberg ("Report on Etiology and Prevention of Yellow Fever," 1890) has mentioned it; and he has also recorded the finding of similar organisms in material derived from Drs. Domingos Freire and Carmons y Valle; but he did not recognise its presence frequently, probably on account of the employment of insufficiently stringent staining technique.

(5) It is probable that recognition has not been previously accorded to this bacillus by reason of the

¹ The completion of the Interim Report, of which this is an abstract, was interrupted by the onset of attacks of yellow fever in both of us. The loss of my much lamented colleague renders it advisable to submit this shortened report only for the time being.

² We find these constantly enlarged and much injected, though whether this is specific we are not able to say.

difficulty with which it takes up stains (especially methylene blue), and by reason of the difficulty of establishing growths on artificial media.

(6) The most successful staining reagent is carbolic fuchsin solution (Ziehl), diluted with 5 per cent. phenol solution (to prevent accidental contamination during the long staining period); immersion for several hours followed by differentiation in weak acetic acid. Two hours staining period may fail to reveal bacilli which appear after twelve to eighteen hours. The bacilli in the stools are often of greater length than those in the tissues, and they may stain rather more easily; naturally the same is true of cultures.

(7) Since the bacilli are small and comparatively few in numbers they are difficult to find. To facilitate matters at our last two autopsies (fourteenth and fifteenth) a method of sedimentation has been adopted. A considerable quantity of organ juice is emulsified with antiseptic solution, minute precautions against contamination and for control being taken; the emulsion is shaken from time to time and allowed to settle. The method is successful and may form a ready means of preserving bacteria containing material for future study. The best fluid for the purpose has yet to be worked out; hitherto normal saline with about $\frac{1}{2}$ per cent. sublimate has been employed.

(8) Pure growths of these bacilli are not obtained in ordinary aerobic and anaerobic culture tubes.

(9) Some pure cultures have been obtained by placing whole mesenteric glands (cut out by means of the thermo-cautery) into broth under strict hydrogen atmosphere. Investigation into the necessary constitution of culture media for successful cultivation is in progress.

(10) Much search was made for parasites of the nature of protozoa. We conclude that yellow fever is not due to this class of parasite. Our examinations were made on very fresh organ juice, blood, &c., taken at various stages of the disease, with and without centrifugalisation,³ and on specimens fixed and stained in appropriate ways. We may add that we have sometimes examined the organs in the fresh state under the microscope within half-an-hour of death.

(11) The endeavour to prove man-to-man transference of yellow fever by means of a particular kind of gnat by the recent American Commission is hardly intelligible for a bacillary disease. Moreover, it does not seem to be borne out by their experiments, nor does it satisfy certain endemological conditions. It is proposed more fully to deal with the endemology and epidemiology of the disease on a later occasion.

(12) We think that the evidence in favour of the etiological importance of the fine small bacillus is stronger than any that has yet been adduced for any other pretended "yellow fever germ." At the same time there is much further work to be done ere its final establishment can be claimed. The acquisition of a new intestinal bacterium would explain the immunity of the "acclimatised."

³ We have found this sometimes useful in examining the blood of ague patients.

Correspondence.

To the Editors of the "Journal of Tropical Medicine."

REFORMS IN THE ARMY MEDICAL DEPARTMENT AND DENTAL SURGEONS.

It is earnestly to be hoped that the reforms in the Army Medical Department, recently promised by Mr. Brodrick in the House of Commons, will include some scheme by which our soldiers and sailors in peace or war can have means afforded them of receiving adequate dental attention. Up to now, all the attempts made by prominent members of the dental profession, backed up by the moral support of the most prominent of the medical profession, to get this want supplied, have been met by the War Office with persistent and uncompromising refusals.

It is doubtful if the present War Minister has ever had the necessity for such an appointment clearly pointed out to him; but it is to be hoped, if the matter is properly represented, that he will have courage to disregard old-fashioned prejudices and take the matter in hand. Evidence is daily coming in of the sufferings entailed by their being no dental surgeons with our armies. In a letter recently received, an officer in the Transvaal complains bitterly that for weeks he had been suffering from toothache with no chance of being relieved. Another, a private, writes that he was suffering such agony in a tooth, and no possibility of having anything done, that he had to look about for pincers of some kind and remove his own tooth.

The War Minister could read with profit the contribution to the *Lancet* made by a dental surgeon who accompanied the Yeomanry Hospital. In this account of his work he speaks of eighty officers at one place who were all in dental pain with no one to help them. The War Office requires the intending recruit to have good teeth but takes no pains whilst the soldier is in the army to have the soldiers' teeth attended to. In this, as in other physical (not to mention moral) matters, the soldier is well-nigh certain to return to civil life crippled for the battle of life, and instead of the army proving of hygienic use to the nation, it but too often proves a waste of human life and a service which "uses up" the health of the young men of the country. The parents of these lads have the matter in their own hands, and it is their business to see that their sons are not handed over, body and soul, to a service which takes but little care of him, which too often, by neglect, ruins his physique, and one in which the so-called discipline proves but a school of physical ruin.

The people have the matter in their own hands, and if they would but rouse themselves from their lethargy and deny the Government the care of their sons until assurance is given that their health would be looked after, they would be performing a real service to the country.

"DENTAL."

Current Literature.

CHOLERA.

DR. J. H. F. KOHLBRUGGE contributes an able article on the vibrio of cholera. The author calls attention to the extraordinary diversity of the bacillus as regards its form, its cultures, and its pathological characteristics. Dr. Kohlbrugge asserts that Koch's bacillus cannot be sharply differentiated from several other allied vibrios. In conclusion the author states that he is of opinion that Koch's comma bacillus is not the direct cause of cholera, and that the cause is some unknown toxin which, influenced

perchance by season, place, or other predisposing causes, transforms saprophytic vibrios into pathogenic agents, which then become the means of propagation of cholera.—*Bulletin de la Société de Médecine de Gand*, September, 1900.

MALARIA.

MALARIA AND MOSQUITOES IN ZEELAND.

By A. VAN DER SCHEER and J. BERDENIS VAN BERLEKOM.

THIS instructive and interesting book contains a number of well-executed photographic plates, and should be read by all students interested in the fascinating malaria-mosquito theory.

Formerly the island of Zeeland in Holland was considered to be the most notorious fever centre of Northern Europe, malaria being at one time endemic there. In 1899 malaria re-appeared in Middelburg, after years of freedom from the disease. Even then it was limited to one part of the town, the most prevalent types being the tertian and double tertian.

It was remarkable that this part of the town was badly drained, and the soil had been disturbed for the construction of canals. *Anopheles* and *Culex* were found in dwelling places at night, but more frequently in stables. *Anopheles* were caught in the stables, and, on examination, found free of parasites, but after allowing the mosquitoes to bite a malarial patient, the parasites of tertian fever were found in the walls of the stomach of some of the mosquitoes. When the parasites were no longer to be seen in the blood of the patient, they were not to be found in the mosquitoes which had bitten him.

The course of development of the parasites in the mosquitoes coincided with the description given by the Italian observers. Van der Scheer observes that development is slower when the temperature is low. He never found the black spores described by Ross, nor was he able to observe the very first stage, as he only examined the mosquitoes two days after infection. Koch's statement that the parasites could only develop at a high temperature is contradicted by van der Scheer's observation, as they occurred in temperatures of 18.5° C., 14° C., and even 11.5° C.

The authors are of opinion that man is not the only host of the malarial parasite, and they suggest that mosquitoes in stables should be killed by means of sulphurous fumigations.

DOUBLE SCIATICA OF MALARIAL ORIGIN.—The patient, a man, aged 45, was found lying in bed, crying in anguish owing to the pains which were shooting down the backs of both legs and into the feet. This pain he described "as like that which would be caused by pouring melted iron down both legs." He had been suffering from similar attacks, although of milder character, on alternate days for a week past, and mentioned that they always commenced with a chill, followed by fever and sweating. The attack would last several hours and then pass off, leaving a feeling of soreness in the affected part. On this account malaria, of course, was at once thought of, and the opinion was confirmed when I was told that the patient had lately returned from

the tropical regions, where he had several attacks of "ague." The pain was paroxysmal; the patient would have a brief interval of comparative quiet, then he would suddenly cry out, and the flexor muscles of the leg would contract spasmodically. In a few seconds he would be quiet again. The slightest movement of either leg would bring on another paroxysm of pain. There was marked hyperæsthesia, besides which painful points were especially marked at the sacro-iliac junctures in the popliteal spaces and back of the external and internal malleoli. The patient was also suffering from violent headache, the temperature was 104.3 degrees, and the spleen was enlarged. There was no history of syphilis, rheumatism or any other special cause for the sciatica. He was ordered sulphate of quinine, grs. 25, to be taken in divided doses during the night, and sulphate of morphine, gr. 1/4. The next day he was entirely free from pain, and his temperature was normal. The quinine was kept up in smaller doses during the day, and grs. 20 were ordered to be given on the following day about two hours before the paroxysm had usually occurred, with the result that he escaped the usual attack. Quinine, grs. 5 t. d., and a mixture of arsenic and iron were taken for several months, after which he stopped the medicine. In May last he had another attack which yielded to similar treatment, since which time he has enjoyed fair health.

This case presents two unusual features. First, both sciatic nerves were simultaneously affected, which, while it occasionally occurs, is far from common. Secondly, while malarial poisoning is a well-known cause of neuralgia of the trigeminal and intercostal nerves, most authors give it no place as a cause for sciatica; indeed Erb says: "All authors consider it doubtful whether it can be induced by malarial infection, as a typical example of sciatica is extremely rare in periodic fevers." On the other hand, however, Putzel says that the sciatic nerve is next to the trigeminus, most frequently attacked. In spite of this assertion, while no doubt similar cases have occurred, I have been unable to find any report of one.—*Medical Times*, January, 1901.

MOSQUITOES IN HONG KONG DURING THE MONTHS OF OCTOBER, NOVEMBER AND DECEMBER, 1900. EXAMINED AND REPORTED UPON BY DR. J. C. THOMSON. —In a report to the Government of Hong Kong Dr. Thomson summarises his examination of 3,539 mosquitoes examined as follows:—Of the total number 294, i.e., 8.3 per cent. were proved to belong to the genus *Anopheles*, of which two separate species were caught; and 3,245, i.e., 91.7 per cent., were of the *Culex* type of which seven species were identified.

	Mosquitoes examined	Anopheles.		Culex.		Cases of Malarial Fever sent to Government Civil Hospital by Police
		No.	Per Cent.	No.	Per Cent.	
October ...	401	106	26.4	295	73.6	66
November ...	796	50	6.3	746	93.7	23
December...	2,342	138	5.9	2,204	94.1	17
The three months	3,539	294	8.3	3,245	91.7	106

Dr. Thomson proposes to extend his inquiry over the whole of 1901, when an approximately accurate

classification of the mosquitoes prevailing in the Colony of Hong Kong may be obtainable.

THE NON-MALARIAL FEVERS OF THE TROPICS.—As one result of the growing feeling of certainty in regard to the mosquito theory of malaria, and of the general recognition of the reliability of the indications given by the microscope in the diagnosis of the disease, it is probable that we shall before very long find a large increase in the number of separate and well-differentiated febrile maladies met with in the tropics. Wherever any one particular disease greatly predominates there is a natural tendency among those who practice in that district to attribute to the predominant ailment any malady which has even the most superficial resemblance to it, and this has been markedly the case in regard to malaria. Malaria often presents anomalous features, and in malarious countries it is frequently found that strange and obscure cases clear up under quinine. Hence the strong temptation to dub every fever malaria and every case of debility malarial cachexia; a temptation to which one can hardly doubt that many practitioners have given way. The result has been, on the one hand, much loss to many patients by time being wasted in unavailing efforts to cure them with quinine; and, on the other, much undeserved doubt as to the efficacy of quinine in consequence of this drug being used in cases to which it was quite inexplicable. There can be but little doubt that among the crowd of fevers which have been spoken of as abnormal cases of malaria, or explained as double infections overlapping one another, or united together as malarial remittents, a large number are not malarial at all. The efficacy of quinine has had the effect of demoralising the doctors in malarious districts, and this drug has seemed sometimes to have become the Alpha and Omega of all medical effort. Signs are not wanting, however, that the efforts of the large number of well-qualified men, who are now engaged in the investigation of tropical fevers—and are now able, armed with the microscope, to separate—will throw considerable light upon this large question. By aid of the power they now possess of putting on one side most cases of malaria, they will be able to devote themselves to the task of differentiating the various diseases which make up the remainder, and we can hardly doubt that before many years have passed the subject of tropical fevers, hitherto so dominated by the ever-present intrusion of malaria, and obscured by the routine treatment by quinine, will have to be entirely rewritten.—*The Hospital*, February 2, 1901.

THE MALARIAL MOSQUITO ON THE SUSQUEHANNA. By Harvey B. Bashore, M.D.—During the past summer I made some observations to ascertain the prevalence of the malarial mosquito (*Anopheles*) in this locality; namely, the suburb of Harrisburg. The conditions existing this season were, according to the popular notion, very favourable for malarial development—a low stagnant river and considerable hot weather. The recognition of the *Anopheles* is extremely easy with the aid of a small pocket lens; the characteristic points being the spotted wings, long “feelers,” and resting-position. This resting-position,

although rarely at right angles to the surface, is at such an angle that with a little practice one is able to tell *Anopheles* from the position alone. Mr. L. O. Howard, the government entomologist, kindly verified the species for me. During the great heat-wave from August 14 to August 22 inclusive, while the temperature was ranging between 70 and 100 degrees F., mosquitoes were exceedingly plentiful and became a decided annoyance, even in the houses which were properly screened. During this period I captured and examined 540 specimens, of which 400 were *Culex* and only 140 *Anopheles* (133 being *quadrimaculatus* and 7 *punctipennis*); that is, only 25 per cent. were “malarial.” During this time there was very little malarial fever; I saw, I believe, only one case of intermittent fever in my own practice. After the great storm in September, a cool wave spread over the region with the temperature in the morning ranging between 50 and 60 degrees F. During this period, although mosquitoes seemed very rare, I managed to capture 78, of which 56 were malarial—about 74 per cent. Then (hardly a mere coincidence) there was an unusual outbreak of intermittent fever; personally I saw twenty cases in ten days, mostly tertian, requiring large doses of quinine and showing a marked tendency to relapse later on. Late in September and at the beginning of October the *Anopheles* occurred only in the ratio of 50 per cent., and during this time there was a diminution of the number of cases of fever—twelve in thirty days. In the month of October we had several severe frosts, and in the latter part of the month very fine weather, but *Anopheles* seemed to have gone into winter quarters, for only 16 per cent. of the mosquitoes belonged to that family; likewise the intermittent fever seemed to have vanished, for there existed hardly a case. In every instance the mosquitoes were captured in the same place—the back porch and an out-building of my own residence—and, although there was no fever in this house, nearly all my cases occurred within a few blocks of it.—*Medical Record*, February 2, 1901.

TO WARD OFF MOSQUITOES.—A resident of New Jersey writes to the *Public Health Journal* to say that he wards off mosquitoes by applying to his face, hands, and other parts, every two or three hours, a mixture of one part oil of sassafras to five parts of alcohol. We are afraid that except when mosquitoes are very numerous indeed, few will care to avail themselves of this form of protection.

PLAGUE.

IN CAPE TOWN plague has appeared and threatens to become serious. On February 26, thirty-one cases were stated to have occurred; on February 27, two fresh cases were reported in the city, and four of the “contacts” developed the disease. Several Europeans have been attacked, and cases of plague have been found some distance beyond the limits of the city. Viewing the extraordinary amount of traffic at Capetown at the present moment, both seaward and inland, the danger to Britain and the interior of South Africa is a matter of deep concern. Professor W. J. Simpson seems to be taking an active part in

the necessary steps to be taken in Capetown, and the Government of the Colony have superseded the Corporation of the city in all matters affecting plague. It is fortunate that Professor Simpson's experience and advice is available at Capetown during the present crisis; for not only as a sanitarian of eminence but also as a plague expert his opinion must be welcomed.

BOMBAY.—Telegrams, dated February 27, state that in the city of Bombay 400 persons died of plague during the two previous days.

SINGAPORE.—Three cases of plague were reported at Singapore on February 25. This is the first time that acknowledged cases of plague have appeared in this Colony.

MISCELLANEOUS.

THE Japanese are a progressive nation in the broadest sense of the word. During recent years they have made huge forward strides. They have sent their young men to Europe to study medicine and law; they have founded universities in their own cities. Their navy is equipped with all modern requisites, their army is beyond reproach, and their ambulance arrangements during the recent Chinese campaign have won the admiration of the European powers. In addition, the women of Japan are now being assisted to make a distinct advance. Some years ago the higher class Japanese women adopted European dress, and contact with the outer world has doubtless helped to "emancipate" them from the position they hitherto occupied; for in Japan as in other Eastern countries, ladies have been kept secluded, and their education has been of the most primitive description. A wealthy family of the name of Milsui, has presented a large piece of ground in Tokio as the site of a special university for women, and three generous citizens have supplied the funds—about £24,000—for the construction of the necessary buildings. The promoters of this splendid scheme hope to inaugurate the new University for Women in the spring, and already an enormous number of young girls of good birth have made application to be admitted to the various courses which will include the study of medicine, civil engineering, &c., &c. In the course of a few years, therefore, the Japanese will have "Lady Doctors" in their midst, and who knows how soon we may not hear of Japanese Lady Dentists, electricians, and civil engineers.

MESSRS. HUMPHREYS, of Knightsbridge, London, S.W., are rapidly acquiring world-wide notoriety. In addition to having erected some hundreds of hospitals in the United Kingdom and abroad, this enterprising firm manufactured and shipped the buildings of the "Princess Christian" Hospital, as also the Scottish National Hospital and others for the soldiers in South Africa, and during the last six months they have supplied, on account of the War Office, over £100,000 worth of military hospitals and barrack huts for use by the troops at the front.

THE mosquito hut erected in the Roman Campagna, and inhabited by Drs. Sambon and Low and others during the summer of 1900 with a view of de-

monstrating the truth of the mosquito-malaria theory, was designed and manufactured by Messrs. Humphreys. The complete protection against malaria and mosquitoes afforded to all those who resided in this hut is a sufficient guarantee of the efficacy of such protection, and of the trustworthiness of Messrs. Humphreys' work.

HÆMOGLOBINURIA COMPLICATING TYPHOID FEVER.—Drs. John H. Mussie and A. O. T. Kelly, of New York, relate a case of typhoid fever in which hæmoglobinuria existed for at least seven days in a patient in which malaria as an ætiological factor was entirely absent. The patient recovered.

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THE following table from the *China Medical Missionary Journal*, January, 1901, affords definite information of the extent to which the Chinese avail themselves of treatment in foreign (European and American) hospitals:—

HOSPITAL STATISTICS FOR 1899.

Location	Mission	Out-patients			In-Pat.	Oper.
		New	Old	Total		
Reported in July and October— 40 hospitals		..	..	400,264	16,304	14,133
Chingchow	E. B. M.	7,294	2,556	9,850	211	..
Foochow	A. B. C. F. M.	20,044	357	1,188
"	"	4,376	190	..
Total of 43 hospitals and dispensaries				434,584	17,062	15,321

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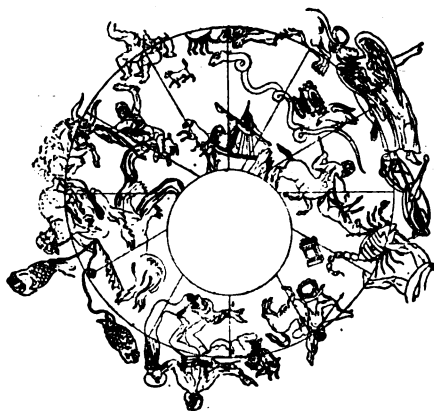
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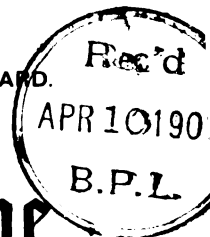
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THE

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EDITED BY JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D., F.R.C.P.

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The Journal of Tropical Medicine.

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Original Communications.

THE LIVERPOOL SCHOOL OF TROPICAL DISEASES—ADDRESS BY SIR WILLIAM CHURCH.¹

PROPOSED ENDOWMENT OF A CHAIR OF TROPICAL MEDICINE IN UNIVERSITY COLLEGE, LIVERPOOL.

(By our Special Correspondent.)

A SPECIAL meeting in connection with the Liverpool School of Tropical Medicine was held in the Council Chamber of the Town Hall, on February 12, to consider the subject of "Health and Sanitation in West Africa and in the Tropics," in the light of the researches of the three malaria expeditions of the School. The Chairman of the School, Mr. Alfred L. Jones, presided, and was supported by Sir William Church, the Lord Bishop of the diocese, Professor Boyce, and Major Ronald Ross. There was a large attendance, including Dr. F. W. Mott (London), many prominent merchants and shipowners, and leaders of the medical profession in the city. Letters of apology for inability to be present were received, amongst others, from Colonel Willcocks, commander of the late Ashanti Expedition, Professor Ray Lankester, and Professor G. Sims Woodhead.

The Chairman said that Liverpool merchants, and others who had connections with the tropics, had for many years been very much concerned and interested as to whether it was possible or not to introduce a better state of life for the people they had to send into those parts of the world, and also for the native population. It had occurred to the Committee of the School that there were possibilities in this direction,

and it had occurred to them that the past had been notable for the neglect and for the want of interest in tropical diseases. It had been evident that while we had been studying at home all kinds of disease, we had forgotten to some extent the cause of our fellow countrymen who had had to go to other climates to seek their living and to try to make the commerce of the world. He wished to pay a high tribute to a late member of the expedition sent to the Brazils, Dr. Myers, who had gone out solely in the interests of science and humanity. While at Para he contracted yellow fever, to which, unfortunately, he succumbed. The Committee, thinking what they could do to perpetuate his memory, had decided to place a memorial plate in the hospital at Birmingham, and to erect a gravestone in the churchyard where he lies buried in Brazil. He was glad also to be able to announce that a Chair of Tropical Medicine was to be endowed in the Liverpool University College, to be called the Walter Myers Chair.

Sir William Church, who was received with hearty applause, said that two years or so ago they asked him to be present at the inaugural gathering of the Liverpool Tropical School of Medicine—a gathering which was in every sense representative both of science and medicine, and of the commercial activity of Liverpool, Manchester, and other great industrial centres. Everyone who was present on that occasion must, he thought, have been struck as he was with the enthusiasm with which the idea had been taken up. It had been taken up by members of his own profession in this great town, and also by leaders of the commercial interests of the place; and one could not help feeling that the promoters of the movement at all events meant business, which was proved, he thought, and also the wisdom and energy with which the movement had been carried on were proved, by

¹ Meeting at the Liverpool Town Hall.

the results already obtained. It was perhaps too soon to speak of any fruit having been gathered in the shape of commercial profits, but already there had been a notable increase in the amount of our knowledge of malaria and other tropical diseases. He thought he could in a few words assure them of the wisdom of the movement. Going back to olden time Bacon had said in one of his axioms, "It is madness to suppose that that which has never yet been done can be accomplished except by using untried means." Now the School of Tropical Medicine in Liverpool had in a certain sense made use of untried means. He thought he might say it had been the first to send out properly educated and suitable missions to study the health and sanitation of tropical climates and their diseases on the spot. Of course they might say that the Government had at times done something of the sort. It was quite true that Government had on several occasions sent out missions, such as the Leprosy Mission and the Plague Mission, but they had differed—and differed very materially—from the expedition that the Liverpool School had sent out. They went out to obtain evidence, to hoard it and sift it, and to collate it; and from the varied experience of different individuals to try to arrive at some useful conclusion. Now in his opinion the Liverpool School of Tropical Medicine had wisely determined early to send out expeditions to study diseases upon the spot. Already in their records they had shown that no fewer than three expeditions had been despatched to West Africa, and a fourth expedition was now engaged in studying the no less dreadful foe to his mind, namely, yellow fever, in its own haunts. It was perhaps too early yet to venture to say much as to the results from the medical or scientific points of these expeditions. But as he had previously said, much had already been accomplished. There was a very old adage that "Knowledge is power;" and power as they all knew, whatever form it might take—whether manual, steam or electric—was dependent on the exhibition of forces that somehow or another had been accumulated. Now one of the forces which tended to the progress of the world was the force of accumulated knowledge—the garnered stores of the numerous generations which had preceded us. Another form of power or force was that of accumulated wealth, riches and money. The search for knowledge was arduous. It required untiring patience and unwearying labour, and an expenditure of material wealth, and even more than that; for although it required the sinews of war in the shape of money it also needed great patience, toil and suffering, not to speak of loss of life. They had all heard of the great sorrow among the band of workers through accidents that happened, and loss of health and life. They now had to deplore the loss of one whose life promised to be unusually bright and useful to mankind—he alluded to the death of Dr. Walter Myers. But his life had not been wasted. His sad experience had taught them that this loss was only part of the price which must be paid if they were to endeavour to unfold the secrets of nature. Just as in the search for material wealth, so in the search for knowledge, it had always been the case that life had been sacrificed; and so he feared it would

always be. Apart from knowledge, however, it was quite evident that considerable if not large sums of money would be required to keep up the excellent hospital which the Liverpool School had already founded, and which by the report he saw had already done good work. In his opinion, however, still more help was wanted to continue these expeditions, which had already done much to increase our knowledge of disease, and which, to his mind, were the surest and best means to enable us so to improve the health and sanitation of tropical climates that they might not be as dangerous as they now were to the lives of Europeans. It had been computed by extremely able men that the mere cost of the machinery of carrying on the government of such places as our West Coast Settlements and other malarious and unhealthy districts was more than double that in other parts of the world—in other words, it took two men to do what might be and ought to be done by one. Enforced absence had to be taken into consideration. If they were to lessen, even by one half, the expenses of the Government, even, say, the expenses from mortality and invalidism of these countries, how great would be the increased volume of our trade from these sources! There was reason for thinking that many of them were the richest countries on the face of the globe, so that he thought an investment of money in these places would not in the long run turn out to be a bad one; and he thought that the profit, even looked at from a commercial side, would be such as would amply repay the original investment. He therefore, not only in the cause of science and humanity, but even in that of the commercial prospects of this country, hoped that means might be found by which the Liverpool School of Tropical Medicine might continue to extend the scope of its work which had been so very successfully begun.

Major Ronald Ross described briefly the scope and results of the expedition sent to West Africa. After mentioning the places visited, he dealt with the observations of the members of the first expedition from a sanitary point of view. The water supply throughout the country, he said, was the best obtainable—rain water. All other sources of supply were contaminated by the natives. It was feared that through neglect of the precaution of boiling the water during the dry season some cases of disease arose which might be prevented. The houses of European Government officials were generally well situated, but those of the various trading companies were usually placed on undesirable sites—often in low-lying districts in close proximity to swamps, and more particularly to the crowded huts of the natives. As to the conservancy system, the method adopted in most places was admirable, but in a few others considerable improvement was desirable. Throughout the whole country the question of food supply was a very difficult one, and a supply of meat and vegetables from England—preserved by refrigeration or some other method—would be of inestimable benefit. Regarding European habits, there was some tendency to excess both in eating and drinking, and the nature of the climate of the country did not inspire one to take exercise. After a visit extending over a period of eight months, and covering a large extent of the

country of Nigeria, the members of the expedition had been able to arrive at the following definite conclusions as to how malarial fever could be best prevented in the districts they had visited:—(1) Living apart from the natives at a distance of about half a mile. This they had arrived at from a consideration of the habits of the mosquito of the genus *Anopheles*, and from the examination of the natives. Native children to a very surprising extent had the parasites of malarial fever in their blood, and the mosquito mentioned conveyed the disease from the infected children to Europeans living in the neighbourhood. (2) The efficient surface drainage of the areas round European quarters. This measure alone, without the application of the previous one, would not be efficient, but combined with it the two together would secure complete freedom from the disease for Europeans.

The Lord Bishop, referring to the beneficial results of the application of science to tropical diseases, said they were of a threefold character. First, there was the expansion of trade, and the expansion of trade meant the employment of a far larger number of our countrymen and men of other nations in giving to those nations of Africa commodities which they did not at present possess. Secondly, it meant the extension of knowledge. The confines of knowledge were being, so to speak, pushed back, and new provinces and new empires were being annexed in which those who cared to study the races and languages and manners and customs and many other such things would find a wider scope than they had ever found before. And last, and not least, it meant the advance of Christian civilisation.

Professor Bryce spoke of the wisdom of the Committee of the School in sending out expeditions to study the causes of diseases on the spot, and said the results of those investigations were now finding their way into medical literature, and would soon, no doubt, become classic. He paid an eloquent tribute to the late Dr. Walter Myers, whom he had personally asked to join the expedition to Brazil. He hoped that before long there would be an endowed Chair of Tropical Medicine to the memory of Dr. Myers, and that there would also be scholarships connected with it.

SOME NOTES ON BLACKWATER FEVER. MORE ESPECIALLY IN REGARD TO ITS CAUSATION AND TREATMENT.

By R. U. MOFFAT, C.M.G.

Principal Medical Officer, Uganda Protectorate.

THERE are three prevailing theories concerning the cause of blackwater fever, all of which have their advocates. These are:—(1) The quinine theory with various modifications; (2) the malarial theory; and (3) the theory that the disease is one *sui generis* having no necessary connection with either malaria or quinine.

The exponents of the quinine doctrine do not agree among themselves as to the exact manner in which the drug exercises its baleful effect. Some, now probably the minority, assert that quinine is the sole

and only cause of the hæmoglobinuria which at times complicates malaria fever. These base their belief on the established fact that in some rare cases the administration of quinine, even in small doses, is invariably followed by the appearance of hæmoglobinuria. That such cases do occur is, I suppose, undoubted, but surely they should be regarded as examples of a special idiosyncrasy, when it is known that thousands of people daily take quinine without any such evil effects.

Others hold less hostile views of the drug, but at the same time assign a certain share of the evil to its effects. These state that hæmoglobinuria is caused by quinine acting in conjunction with the malarial parasite; but that either of these factors by itself will rarely produce the condition.* On what foundation does the theory rest which ascribes a causal relation between quinine and hæmoglobinuria? Omitting the cases of idiosyncrasy above referred to, in which the administration of quinine *always* results in hæmoglobinuria and which prove nothing, there remains only the fact that in the great majority of cases of blackwater fever there is probably a history of quinine administration shortly before its onset. Is this a matter for surprise when we consider the fact that 90 per cent. of the cases of malaria occurring among Europeans are treated with quinine? It is difficult to find a case of malaria in a European which has not been so treated to a greater or less extent, and yet after all it is but a small proportion of these cases which end in blackwater fever. But this is not all, for amongst the small number, the 10 per cent. who are not treated with quinine, among these a certain number develop blackwater fever, and, what is more, a larger proportion than among the 90 per cent. who do receive the drug. Why therefore should we attribute to quinine a malady which may develop whether the drug is taken or not?

I have myself during eight years in East Africa treated many cases of malaria. At all times and increasingly of late years I have relied entirely on quinine in large doses. During this time I have never seen a patient develop blackwater fever while under careful treatment. In my own personal attacks, five in number, their severity has been in direct proportion to the extent to which I had through carelessness neglected quinine.

As showing that there is no special idiosyncrasy in my case, I might mention that in my youth, while living in Bechuanaland, South Africa, I was treated largely with quinine for the simple malaria of that country. Further, during the intervals between my attacks of blackwater fever in this country, I often suffered from most severe malaria for which I took large doses of quinine. On one occasion, ten months after my first attack of blackwater fever, I was troubled with severe and persistent malaria. My services were urgently required for an expedition, so I adopted heroic measures, taking in several doses 100 grains of quinine on each day for two consecutive days. For a week longer I took 50 grains a day, and then gradually reduced the dose until the end of a fortnight. The results are interesting. No hæmo-

* Plehn, "Tropical Anæmia," *Journ. Trop. Med.*, No. 18, vol. ii., January, 1900.

globinuria resulted, malaria disappeared, and for seven months I enjoyed better health than I had ever done before in the country. The possibility of *post hoc sed non propter hoc* appears to me to have been overlooked by those who hold the quinine theory in any shape or form. After long and extensive malarial experience I am bound to say that in my opinion it is an utterly erroneous and mischievous doctrine.

Before proceeding to the malarial theory, I will just shortly refer to the third one mentioned which regards blackwater fever as a distinct disease. The arguments which have been brought forward in support of this view are mainly negative, no positive evidence having been adduced in its favour. The geographical distribution of the disease, the absence or scarcity of the malarial parasite, its analogy with Texas fever, such are the main arguments of those who hold this view. Others have pointed out that, in places where malaria and blackwater fever occur, the maximum prevalence of the latter does not coincide with that of the former, and that therefore it cannot be a malarial disease. The first and second arguments are more or less explainable even on the malarial hypothesis; while the third, based on analogy, does not bring much conviction unless supported by other facts. In regard to the fourth argument, it appears to me illogical. Everyone will admit that there is such a thing as malarial neuritis, and no one would deny its malarial origin on the ground that its prevalence did not correspond with that of malaria. We do not know what the exact conditions are which cause malaria to produce a neuritis in one person and not in another; but certain it is that a hundred cases of malaria may come under observation without one of them showing signs of neuritis, while among the next twenty cases there may be more than one example of the condition. In the same manner, if hæmoglobinuria is, as I believe, merely a complication of malaria, there is no reason why it should necessarily occur more frequently when malaria is most prevalent. If the conditions which lead to its development are absent, hæmoglobinuria will never occur however rife malaria may be.

There remains now for examination the malarial theory which states that blackwater fever is nothing more than a more than usually intense infection by malaria. Expressed thus the theory is open to a very grave and apparent objection. We know that some attacks of malaria, so severe as to end fatally, may run their whole course without any signs of hæmoglobinuria. On the other hand the latter appears often during malarial attacks of mild or at any rate medium severity. It cannot therefore be said that the occurrence of hæmoglobinuria bears any strict relation to the degree of the malarial infection, though it should be remembered that different individuals vary in regard to the extent to which they react under the influence of malarial poison, and the intensity of the symptoms are not invariably in direct ratio to the number of parasites observed. The objection, however, holds good and we must admit that an intense isolated malarial infection cannot be the sole cause of hæmoglobinuria. If, therefore, it is a

malarial manifestation, it must be regarded as a complication of the disease which only supervenes if the necessary conditions and causes which lead to it are present.

Regarded in this light the malarial theory appears to me sound and free from manifest objection. The question now arises, is it possible for us to discover what those conditions and causes are which lead to so serious a complication? In my opinion there is no doubt that to produce the result both the condition and the cause are generally essential. Either one without the other is probably harmless.

And first in regard to the condition which favours the development of hæmoglobinuria. Amongst whom does it most frequently occur? It is well known that the disease does not often attack newcomers. As a rule the subjects of it are those who have been some time in the country and who have suffered to a greater or less extent from malaria. In some cases this is not so, and a patient may develop hæmoglobinuria during his first attack of fever, especially if he has been some time in the country. Under these circumstances the probability is that he has been suffering from latent malaria without being conscious of the fact. Plehn† regards the production of the predisposition to hæmoglobinuria as due to the influence of the "primitive forms" which he describes, and which he affirms are capable of living and multiplying in the blood for long periods without producing any effects beyond a certain amount of anæmia. This may be so, but personally, being unacquainted with the primitive forms, I have always ascribed the anæmia and the predisposition to blackwater fever to the effect of the plasmodial parasites causing either acute or chronic malarial attacks. I have long held the view that probably a certain number of parasites, possibly a varying number in different individuals, are necessary in each case for the production of a manifest malarial attack. If the parasites are not sufficiently numerous no actual attack will occur, but the patient suffers nevertheless a certain amount of injury. In this way a chronic infection may exist without the patient's knowledge. Whether in this way or by a series of acute attacks a condition is at last produced which favours the occurrence of hæmoglobinuria, if the exciting cause is provided.

Plehn, as stated above, adopts this view of the production of a predisposition, but ascribes it to the "primitive forms" which at length bring about a state of things in which " . . . the blood-building organs are at last incapable of regenerating enough blood to meet the unusual and persistent demand brought about by the continual dissolution, and finally yield in part a defective supply" (the italics are mine). Whether caused by primitive forms or by the plasmodium, a time comes when a certain number of corpuscles are deficient in stamina, if I may call it so, and this is what I would call the condition necessary for the production of hæmoglobinuria. Now, given the condition, what are the exciting causes? In some cases it is possible that a severe attack of malaria will in itself be sufficient, but, as a rule, I believe something more is required.

† Plehn, *loc. cit.*, *Journ. Trop. Med.*

In my experience, the exciting cause is generally a chill during a certain stage of a malarial attack when the parasites are in active development. It is important to note that I say in active development. Everyone will admit that a chill, in a malarious subject, is one of the surest ways of stimulating the ordinary disease into activity, but I hold that for a chill to produce hæmoglobinuria the parasite must be actively developing, in other words, it is a chill acting on an already present attack of fever, but, what is most important, *only at a certain stage.*

I am aware that many observers share with me the view that a chill is in some way connected with the production of blackwater fever, but I have not yet seen the fact pointed out that, for the chill to have this effect, it must act at a certain stage of the malarial attack. Further, I have not seen any explanation offered as to the manner in which the chill so acts.

My theory on the subject is as follows:—Blackwater fever is a complication of malaria only produced when the blood glands have lost their normal regenerating power, either through the influence of malaria or any other constitutional cause. It is then caused by a chill acting on the surface of the body when the malarial parasites are in active development some hours before their sporulation. The effect of the chill is to cause a determination of the parasites to the deeper organs at a time when they should be in the peripheral circulation, and as a result sporulation takes place prematurely and there is a sudden death of all parasitic-bearing corpuscles.

The latter part of this theory dealing with the manner in which the chill acts is of course pure speculation, though there are facts which support it. In regard to the main point, the influence of chill at a certain stage, my opinion is based on practical experience so often repeated that it is impossible to regard it as coincidence. It remains to discuss the various aspects of the disease and to observe how far they are explainable on the above theory.

(1) *Parasitology.*—It is unfortunate that we seldom are able to examine the blood until after hæmoglobinuria has set in. This fact in itself is an argument in favour of the theory, for it amounts to this that if a patient is kept warm in bed under treatment he will not develop blackwater fever. By the time the condition is established it is generally too late to look for parasites. The mere presence of the hæmoglobinuria shows that there has been a tremendous mortality of corpuscles, especially those infected. At times parasites are found, and these are the malarial. I have only once had an opportunity of examining the blood prior to the onset of hæmoglobinuria. In this case the patient was a black boy, who is the only example that has come under my notice of a native getting blackwater fever. He came to the dispensary one morning complaining of fever. His temperature was 104 degrees F., and I was further struck by the fact that he was fearfully jaundiced. Being a native I did not think of blackwater fever, so giving him a dose of calomel and 20 grains of quinine I ordered him to go to bed. Needless to state he did not carry out my instructions, and that night he was attacked with blackwater fever. At the time of his first visit I had taken a

specimen of his blood and found it swarming with parasites. Early next morning he was admitted to hospital, but I could not find a trace of parasites. He was treated with hypodermic injections of quinine and in three days was convalescent.

For some reason the parasites disappear directly hæmoglobinuria ensues, whether quinine be given or not. How is this explainable? I think I am right in saying that most authorities agree that quinine does not act on the more developed forms, and when these are present in the blood the administration of the drug will not stop that attack of fever, though it may prevent the next.

If then the parasites—the sporulation of which brings on the attack of fever which is complicated by hæmoglobinuria—if they sporulated naturally we should expect to find a new brood in the blood. This we only exceptionally do, and this is the experience both of those who give quinine and those who do not. This fact appears to me to favour the idea that the brood, the sporulation of which produces the blackwater fever attack, aborts, and for this reason few parasites are found and the disease tends to a spontaneous cure. I have long noticed that it is during the apyretic stage that a chill is dangerous, and it is interesting to note that this is the period when the parasite is as yet immature. Stephens and Christophers† state that the time taken by the tertian parasite to develop from the smallest to the largest size is about eighteen hours, while the remainder of the time is passed in the internal organs. There must be some reason for this varying distribution, and it does not seem unreasonable to suppose that any cause which drives the parasite into the internal organs at a time when it ought to be circulating in the peripheral blood, might lead to a deviation from its ordinary method of development.

In this way I would explain the influence of a chill on the body surface. By a chill I mean any influence which may lead to a lowering of the surface temperature. The patient may not be conscious of it, for this effect may be produced by simply sitting lightly clothed in a more or less draughty room.

(2) *History of onset.*—The history of the beginning of all attacks of blackwater fever show a painful similarity. With one doubtful exception all the cases which I have seen or received notes of have come on in exactly the same way. I have carefully noted the accounts of published cases, and where the history of onset is given it is usually the same. Dr. Hanley,§ of the Niger Coast, states that he has never seen blackwater fever develop if a patient is kept in bed and given quinine, and my own experience is identically the same.

The usual history is as follows:—The patient has had fever more or less severely, but feeling himself better he gets up and goes about his duties. A few hours after hæmoglobinuria comes on.

In my own personal attacks the history was the same. By the time my third attack came on I had learnt the lesson, and ever since have been scrupulously careful to avoid leaving my bed until

† Reports to Malarial Committee Royal Society, 1899-1900.

§ Hanley, *Journ. Trop. Med.*, vol. ii., No. 16, November, 1899.

my temperature was normal. In the case of my fourth and fifth attacks I was forced to break this rule owing to urgent medical duty. On both occasions I did so fully conscious of the risk I was running, and in a few hours my fears were realised. Some patients will state that they have had no immediate antecedent fever attack, but they will admit that for several hours before they were feeling very seedy, though probably up and about. In these cases no doubt the temperature had been over normal for some time.

The history of onset therefore is distinctly in favour of the view that the disease is caused by a chilling of the body surface during the early part of the life cycle of the parasite.

(3) *Clinical Course*.—There is, in my opinion, little difference between the course of blackwater fever and an ordinary severe attack of malaria, if we except the presence of hæmoglobinuria, and the fact that blackwater fever tends to a rapid and for the time permanent cure. The initial rigor is often quoted as an invariable symptom of blackwater fever, while in the ordinary malignant tertian it is usually absent. I have known several cases of blackwater fever where there was no rigor, while on the other hand I have noted that in ordinary malaria the sign is not uncommon, especially if the patient persists in walking about and exposing himself after the attack has begun. The severe vomiting is certainly more characteristic of blackwater fever, but in some cases it is not more marked than it may be in any malarial attack. Suppression of urine and nephritis are, of course, symptoms secondary to the hæmoglobinuria, and cannot be brought forward as arguments against the malarial origin of the disease, especially as they may occur in malaria even when uncomplicated by hæmoglobinuria.

The main point in which blackwater fever differs in its clinical course from an ordinary malarial attack is in its tendency to spontaneous cure, and this is entirely in harmony with the theory under consideration. The abortion of a whole brood of parasites clears the system more or less entirely of all malarial parasites. If the violence of the poison generated and the resulting hæmoglobinuria do not kill the patient he speedily recovers. Sometimes the extirpation of the parasites is complete and the patient survives his blackwater fever free from all malaria.

It is a most striking fact, and one which I have noted frequently, that often a patient who has been tormented with malaria will, after an attack of blackwater fever, enjoy for a long period the most perfect health. In other cases some parasites escape the general destruction, and even though the hæmoglobinuria subside, fever may continue for many days. In these cases probably the original parasites were of different ages, and only the more mature ones aborted. It may be asked how, if this theory of the pathology of the disease is correct, it explains the fact that the hæmoglobinuria may continue for several days. Granted that one brood of parasites have aborted owing to being disturbed by the chill, why should their successors, who were not at the right age to be affected, why should they also abort later on when the patient is warm in bed? This is certainly a difficulty, but we know that a vicious

practice once started tends often to continue. In favour of this view we may note the fact that once a man has had blackwater fever he is very apt to get it again later on. The continuance of the hæmoglobinuria may be explained by the supposition that the amount of hæmoglobin set free varies in different cases, and that therefore the length of time necessary for its total elimination varies. I had a case not long ago which illustrates this. In this instance the temperature dropped to normal forty-eight hours after the onset of the blackwater fever. During this period the kidneys had not been acting at all well. On the third day, although the temperature was normal, hardly any urine was passed, and what there was remained black. The condition continued until the fifth day when the patient died of heart failure. The last forty-eight hours he only passed about two ounces of hæmoglobinuric urine. The temperature after the morning of the third day never exceeded 99 degrees. I could not help thinking that in this case death was caused by a blocking of the kidney tubules which rendered the excretion of the free hæmoglobin impossible. I should doubt whether any hæmoglobin was set free after the temperature fell to normal, but owing to the excessively small amount of urine passed the original hæmoglobin set free in the blood persisted until the fifth day. Had the kidneys acted well during the first forty-eight hours, probably the circulation would have been cleared of all free hæmoglobin by the time the temperature fell to normal. I may mention that I did not reach the patient till the second day, and up till then he was untreated. He had also had an attack lasting two days only a fortnight previously. In spite of suppression of urine there were no signs of uræmia, convulsions, or coma. His heart, however, became enormously dilated and he died suddenly of cardiac failure.

(4) *Treatment*.—Acting on this view of the causation of blackwater fever what are the indications for treatment? First in regard to prophylaxis our aim should be to try and prevent the onset of the condition which favours its occurrence, and for this purpose we can only rely on quinine and general anti-malarial measures. The first thing to do, of course, is to avoid infection, but this under some conditions is impossible, and therefore quinine should be taken, at least 5 grains daily. In regard to quinine prophylaxis, to be effective the drug should be taken before infection is possible. That is to say, the daily dose should be started before entering the malarious country. Once a patient is infected the consumption of 5 grains quinine a day will not necessarily prevent the parasites from causing a malarial attack sooner or later. If a malarial attack has occurred the further use of 5 grain prophylactic doses is more or less useless, unless the parasites are eradicated from the system, and this we can only hope to accomplish by large doses of quinine continued daily for at least a month. After that we can again rely on the small daily dose.

If in spite of all precautions malaria develops, the most scrupulous care should be taken to avoid chill or exposure in any shape or form, especially during the apyretic periods of the attacks. No man who has suffered much from malaria, or who has been

some time in the country, should ever leave his bed unless his temperature has been normal for at least twenty-four hours, and even then he should treat himself as an invalid. It is difficult to get patients to carry out this *régime* in tropical countries. Familiarity with malaria breeds contempt and often they get into the habit of treating themselves even if a doctor is available. The idea of lying in bed with a temperature of 99 degrees appears to them absurd. So long as these sort of ideas prevail, so long will blackwater fever claim its victims, and it is our duty to warn patients solemnly of the risks they run. It does not follow that every time a man leaves his bed with an elevated temperature that he will develop blackwater fever, but we never know when the exact condition has been reached in which exposure will produce this alarming result. It is therefore better to err on the safe side and to treat every case as one of potential blackwater fever. A thermometer in a layman's hands is not an unmixed blessing, and continual sucking of that useful instrument is apt to lead, especially in newcomers, to a somewhat hysterical frame of mind; but I think every man ought to have one, and should be taught how to use it. Amongst newcomers the danger of blackwater fever is less. It is more, especially those who have developed the conditions which favour the occurrence of the disease who should be warned. This means those who have suffered a great deal from malaria or those who have lived for a long time in malarious districts. Directly any feelings of fever (and all old residents know them only too well) come on, the temperature should be taken, and if only raised half a degree the patient should get to bed at once. I firmly believe this simple rule would stop many a case of blackwater fever.

Now as to active treatment when the disease has developed. The great question is, shall we or shall we not give quinine? Personally I have invariably done so, and with so much success that I dare not take the risk of experimenting without it. I am fully aware that blackwater fever at times does cure itself entirely without the aid of quinine. In these cases the destruction of the parasites has probably been complete, but how can we always be sure that this has occurred? We cannot trust entirely to the microscope, for those parasites remaining may be so few as not to be detected. The following day they may have increased and we shall have lost valuable time. A man who has hæmoglobinuria is not in a good position to fight any more parasites and he may die, not from the initial hæmoglobinuria, but from a superadded malarial attack. I think, therefore, quinine should always be given not to cure the hæmoglobinuria but to kill off any remaining parasites. I had one case, and several others have been reported to me, in which the hæmoglobinuria subsided after forty-eight hours, but severe fever of a remittent type followed for ten days. Unfortunately in this case I was not able to examine the blood. The case was treated all through with quinine, but it was only after heroic doses that the temperature fell to normal. Such cases are always risky, and to avoid subsequent fever quinine should be given freely as soon as ever hæmoglobinuria shows itself. I cannot think that it acts injuriously, for all cases which

occur amongst the officials in this administration are treated in this manner, and so far the mortality has been wonderfully low.

Owing to the gastric irritability the quinine, and in fact all medicants, have to be administered hypodermically or *per rectum*. I prefer the former method, not only because it is more certain, but also because we require the rectum for purposes of alimentation, and it is as well to irritate it as little as possible with medicines.

I need not refer to other details of symptomatic treatment, but there is one important indication which must not be lost sight of. What we should endeavour to do is to assist the elimination of the free hæmoglobinuria as quickly as possible, and at the same time prevent blocking of the kidney tubules. To attain both these objects the patient should be encouraged to drink freely of all such bland liquids as soda-water, barley-water, rice-water, weak tea, &c. In this way we flush the kidneys and assist the excretion of the hæmoglobin. It is true that as fast as the patient drinks he will vomit again, but even so a certain amount of the fluid imbibed will be absorbed. The free drinking has another beneficial effect. The vomiting continues whether the stomach be empty or full. In the former case painful retchings result which are most exhausting to the patient, so that for this reason alone I think free drinking is beneficial.

The theory put forward is I am fully aware more or less fanciful, but in its main point it rests on the solid ground of practical experience; at any rate it affords a basis of some kind for rational treatment and prophylaxis. A provisional working theory is better than none at all, and it in no way interferes with further research in the matter. Possibly it may be proved before long that the true pathology of the disease is entirely different. In that case I feel confident that chill will be found to be one of the exciting causes whatever the nature of the disease may be.

A CASE OF BLACKWATER FEVER.

A MEDICAL OFFICER RELATES HIS OWN ATTACK.

[We are indebted to Dr. Patrick Manson, C.M.G., F.R.S., for having forwarded this interesting paper.]

Previous History.—Never to my knowledge have I had an illness of any sort previous to joining the A.M.S. in May, 1885. I served in India, September, 1885, to December, 1890, chiefly in Lower Bengal and with Upper Burma Field Force (1886-87).

Most of the stations in which I was quartered were highly malarious, and though I only suffered from fever twice, at Pagan, Upper Burma, and Mandalay, each time without cold stage and cured by quinine, I felt very ill before the tour was completed. On my return to this country I was posted to the Curragh, where I served from January, 1891, to November, 1893. For the first few months I improved greatly, but in December, 1891, I had a very severe attack of influenza—nervous form—followed by severe bronchitis which lasted about five months, and then asthmatic attacks which at first occurred twice a day at regular hours as if influenced by malaria. Suffered from two

other bad attacks of influenza in 1892 and 1893, and was never entirely free from the asthmatic attacks (antipyrin relieved these more than anything else).

Embarked again for India November, 1893, and was posted to Madras, January, 1894. Here the asthmatic attacks gradually disappeared and I had one sharp attack of influenza (doubtful, may have been malarial fever). Was moved to Rangoon September, 1895, where I suffered from frequent slight attacks of fever (without any cold stage). During the rains of 1896 became more and more debilitated, liver and spleen enlarged and was invalided home, March, 1897, having had one sharp attack of fever on January 7, which came on immediately after sitting up all night with a patient.

N.B.—Neither of these sharp attacks were preceded by a noticeable cold stage—before the first I had been taking no quinine, before the second I had been taking 10 or 20 grs. daily for at least two or three months. Nothing peculiar was noticed in the urine.

Returned to India again in December, 1897, and was posted to Belgaum, where I served until March, 1899. Had no actual attack of fever during this period, but felt the effects of climate very much.

Arrived home April, 1899, and served at Cork, Waterford, the Curragh, Irish Manœuvres, and Cork again. While at the Curragh under canvas in July, I was flooded out one night during a thunderstorm and the asthmatic attacks came on again. Mobilised at Aldershot November, 1899, and sailed for South Africa, December 9.

Served with 11th Brigade Field Hospital during the relief of Ladysmith and subsequent manœuvres to Elandslaagte until May 12, when I was transferred to Chieveley to charge of No. 4 Stationary Hospital. Moved with this Hospital by rail to Newcastle on June 4, up to which time, though I had had several asthmatic attacks and felt the variations of temperature very much, my health on the whole had been excellent—weight 13st. 2½lbs.

At Newcastle the weather was very much colder, with hard frosts at night and it was impossible to keep warm.

June 4th.—On arrival at Newcastle I slept the first night in a Dutchman's house which had been recently occupied by Boers, and about June 6th, a sickly looking kitten from this house found its way into my hut at night and slept on my bed. Next day I found I was bitten severely by insects of sorts over the left side of abdomen and also on the following night. Of course it may not have any significance, but this was the only time I was bitten by anything while I was in the country.

Prodromata.—On June 8, I noticed slight irritation in the urethra when passing water. On the 9th the same, and also felt very sick shortly after sundown. Felt half frozen during the night but got up usual time next morning (10th) and though shivering, ate breakfast and lunch as usual; continued to shiver all day and grew worse as sun went down. Could not eat dinner so took gr. x. quinine and went to bed.

First Attack.—Temperature about 7 p.m., June 10, 101.4°. The rigor continued some time after going to bed and the temperature gradually rose, reaching its maximum about midnight, but I was too ill to take

it—it was certainly over 103° and probably nearly 105° F. Sleep impossible, owing to severe pains in back (across sacrum) and legs; restlessness extreme, with a feeling of being bruised all over. Heart's action very rapid, breathing difficult, mouth dry and clammy. Headache, at first frontal and not very severe. Began to improve about 4 a.m., from which time these symptoms gradually abated.

11th.—At 10 a.m., T. 101°. Tongue coated all over—white at sides and brown in centre, large and flabby and marked by the teeth. Bowels constipated, jaundice slight. No vomiting, was able to take milk and soda freely. Micturition frequent, about 3i. at a time with intense scalding; urine orange coloured, becoming darker towards evening. Restlessness and sleeplessness continued.

12th.—Easier, but scalding intense; urine dark, smoky, small quantity of blood passed at the end of the act from about midday; little sleep.

13th.—Felt much better every way except that the urinary symptoms continued the same. Quinine omitted and potas. bicarb. and hyoscyamus taken instead. Slept better.

Second Attack.—Was feeling so much better on 14th that I thought the attack could only be one of ordinary malarial fever, and as on the 13th went outside to the latrine tent about 11 a.m., but otherwise kept in bed. During the night, however, the pains, difficulty of breathing, &c., recurred, but not so severely as at first. No sleep. Temperature not taken, but probably over 102°.

15th.—T. 100.6° M., 101.4° E. Began quinine again, gr. x. three times. Urine much darker, with large flocculent deposit and what appeared to be a few thin clots. Very little sleep.

16th.—Cinchonised. T. 100° M., 98.6° E. Feeling much better, but for the urine. Slept better.

17th.—Ditto.

18th.—T. normal. Quinine reduced to gr. xv. with acid boric (gr. x. doses) and nux. vom. No blood passed in urine, which now changed to a reddish colour, with only slight precipitate; scalding and frequency becoming less.

19th.—T. normal. Urinary symptoms improving.

20th.—Urine clear. From this until 28th improvement was continuous. I had got on full diet, was able to be up from 10 a.m. to 9 or 9.30 p.m. Pain in the back, which had been continuous at first, gradually wore away, until on 28th I had absolutely none and I felt fit for duty. The tongue, however, never cleaned entirely, a brown triangular strip remained down the centre.

Third Attack.—June 28 was a cold cloudy day, without sun and foggy towards evening. I felt it considerably and remained indoors almost entirely. About 6 p.m. I went out for about one minute, and five minutes later began to feel chilly. Pain up the middle of sacrum gradually came on and the chilliness increased to rigor at 9 p.m., when I went to bed. Temperature then normal, but twenty minutes later 101°, and in half-an-hour 103.6°. All the symptoms of the first attack returned. I was too ill to take temperature during the night, but it must have been over 105°. The urinary symptoms returned, as shown in chart and I felt slight aching in both testes and cords.

Slight left epididymitis on July 1, when temperature again became normal. Urine had a sweetish foetid odour of beef-tea or beef-juice. The boric acid gave almost immediate relief and the urine was clear again on July 4. I felt much worse after this attack than after the other two, and emaciation was more marked.

On July 6 I was transferred by hospital train to Mooi River, being thus apparently convalescent. The tongue remained brown in centre and the pain in sacrum continued. Appetite *nil*, and I was unable for any sustained effort. I arrived at Mooi River about 11 a.m., July 7, and although there had been a heavy frost during the night, and I was chilled through in the early morning, I did not then suffer from a relapse. After arrival I kept carefully in bed all day except for an hour in the morning while the bed was being settled, and then I sat in the sun which was warmer than the ward.

Fourth Attack.—Without any apparent cause, about midnight on July 11, the pains in the back and legs returned with increased violence; I felt as if stretched on the rack. Temperature not taken during the night, was 99° on morning of 12th, when I felt easier. The urinary symptoms had returned, and though there was less irritation and pure blood, there was a great deal more deposit, in fact, for several days the stream was in about this proportion—

the first and last portions consisting of greyish flocculent matter, the centre being clear. I was now becoming rapidly debilitated and though the urine gradually became practically clear, my legs would scarcely support me going downstairs. I was still inane enough to go daily to the earth closet just outside.

Fifth Attack.—On July 21 the urine was absolutely clear and I was feeling much better. Sat in the sun in verandah from 11 a.m. to 4.30 p.m. in a long chair. That night I was on the rack again, not so bad as the previous attack, but next day, 22nd, blood reappeared in urine and E. T. 100.8°.

23rd.—Blood continued. Pain felt down both cords, specially the right.

24th.—Blood continued. Was given two doses of ergot mixture in the evening, and during the night, excruciating agony is a mild term for what I went through. To the pains in back, legs and head of an ordinary attack, was added that of an acute and rapid right orchitis. About 4 a.m. I had to have a hypodermic of $\frac{3}{4}$ gr. morphia. Temperature not taken, but about 11 a.m. on 25th, when I was much better, it was 103°. Urine dark brown, blood slight.

26th.—Urine the same. I was now absolutely prostrate, could only lie on back, could not read, converse or grasp subjects mentioned at the time. Head felt sore outside, specially sides and back, headache constant, but not very severe. Slept very little, never before about 2 a.m., and then very restless, being semi-conscious. Appetite absolutely *nil*. Feeling not exactly "despondent," for I never felt as if I

were going to die, but "not caring which." Emaciation was rapid, and irritability caused by noise of any kind excessive.

27th.—Feeling the same. Fair amount of glairy mucus in urine, streaked with blood, as well as the brown flocculent sediment. Temperature after this was normal and the urine improved slowly, becoming clear on August 1. Appetite remained *nil*, tongue flabby, brown in centre with white edges. Irritability, sleeplessness, and restlessness at night continued. Pain in the back also continued after this attack, and I found that it required the greatest effort to carry on even the shortest conversation or write a short note.

As on each former occasion a relapse had followed on getting up, I now determined to stay in bed for a longer period, although urged by others to get up and sit in the verandah. On August 6, the eleventh day of apyrexia, temperature fell to 96.2°, and remained subnormal until the ninth.

On the 18th I had an exacerbation of the pain in the back, and on the 19th the urine was rather high coloured, but otherwise I had been gaining ground slowly, was getting back on solid food, though digestion was very weak.

Was transferred to hospital ship *Simla*, on August 20, and sailed from Durban on 22nd. Though exhausted when I reached Durban I began to feel better almost immediately, tongue was cleaning and appetite returning for the first time. On 23rd, we met rather a cold head wind and though I took all precautions against chill, slight scalding and aching in the testes returned on 24th.

Sixth Attack.—For the first time I felt a sharp pain over the liver, and lay up all day hoping the attack would pass off, but rigors commenced early in the morning of 25th while in bed and continued all day, temperature rising to 103.6 at 6 p.m. I was given quinine, gr. v. and antipyrin gr. v., which reduced it to 101.4 at 8 p.m. I also had a dose of calomel. All the symptoms—pains in sacrum and legs, difficulty of breathing, palpitation, &c., of the first attack recurred, but not with such severity. The urine was not so dark coloured and there was not so much deposit. Bowels were kept free with salines, two large loose motions being passed daily, bilious with large quantities of mahogany coloured material resembling in appearance the urine I had passed on previous occasions.

This was the mildest attack of the six. Anorexia and insomnia continued till September 5, on which date I began to get on deck again for a few hours daily; appetite then returned and I slept better, putting on flesh rapidly. Indigestion, pain in the back and weakness, continued. Slight scalding returned from September 17 to 19.

Disembarked September 18, and since arrival have had no actual attacks of fever, improvement appeared to be continuous, though very slow. Digestion has been quite right since the beginning of December. Pain in the back at first improved, but never entirely disappeared, it was always worse after standing or walking, and appears to come on in exacerbations about every twelfth day, then gradually getting better (I was practically free from it on December 25 and

26, then January 6, 7 and 8, and January 18, 19 and 20). The tongue was varied in the same way, it was very nearly clean on the dates mentioned, and then gets coated down the centre again. Pains in the legs and restlessness at night also recur the same way. Exposure to cold aggravates all the symptoms, and since January 21 the condition appears to have remained stationary. There has been no recurrence of the scalding, and the urine has remained clear. I have put on a good deal of fat, bringing weight up to about normal, but a very moderate amount of exertion knocks me up.

BERI-BERI IN HONG KONG, WITH SPECIAL REFERENCE TO THE RECORDS OF THE ALICE MEMORIAL AND NETHERSOLE HOSPITALS, AND WITH NOTES ON TWO YEARS' EXPERIENCE OF THE DISEASE.

By R. MacLEAN GIBSON, M.D., C.M., Edin.

DURING the year 1899 there were 428 cases of beri-beri treated in connection with the Alice Memorial and Nethersole Hospitals. The numbers being greatly in excess of former years, it occurred to me that some useful purpose might be served if examination were made into the records of previous years and notes added as to personal experience of the disease during two years' residence in Hong Kong.

The Alice Memorial Hospital was founded in 1887, and the Nethersole Hospital in 1893; both are under the same management, and were built specially for the benefit of Chinese patients. The figures therefore deal essentially with the Chinese, though occasionally Portuguese, Japanese, Indians and Malays come for treatment. As the hospitals are free (with the exception that in-patients pay for food) the cases are drawn from the poorest classes, *e.g.*, coolies, house-servants, workmen and sailors. When epidemic disease is rife in the Colony such people suffer most severely, so from the records of the above hospitals a fair idea of the prevalence of beri-beri in Hong Kong may be gained. Dr. Manson, in notes on "Beri-beri in Hong Kong," says, "It was not until last year, when the Alice Memorial Hospital was opened, that the general medical practitioners of Hong Kong had a proper opportunity to see and study native diseases, and that we began to learn a little definite about our endemic beri-beri."¹

In 1888 the Sanitary Board issued a series of questions to the local practitioners regarding their experience of beri-beri in the Colony, to which answers were sent by most of the medical men, while Dr. J. M. Atkinson, at present Principal Civil Medical Officer, and Dr. Patrick Manson, embodied their replies in short papers. The general facts elicited were that beri-beri was present in Hong Kong; that it had occurred among Europeans and Chinese; that many cases had come from outside the Colony; and that it was more prevalent in 1888 than 1887.² Dr. Atkinson's report deals chiefly with the disease among the Water Police (mainly Chinese) in Hong Kong. To show that beri-beri was known he writes: "The inspector in charge seemed quite familiar with the disease and informed me that it had been a common

complaint among these men for years past, but more men had suffered during the present year."³ Dr. Manson quotes the speech of an honourable member of the Legislative Council in 1887, in which the honourable member had said, "Beri-beri is unknown here. . . . I never heard of it;"⁴ opposed to this Dr. Manson asserts, "I maintain that this most dangerous disease is extensively prevalent in Hong Kong at the present moment."⁵ In the Government Gazette for 1888 reference is made to the first record of the disease in the Colony as having been made by Dr. Wm. Morrison in 1852 in the following words:—"Amongst the natives, dropsies assuming the character of beri-beri afforded the greatest number of deaths. Beri-beri has hitherto been regarded as a disease peculiar to Ceylon, and its appearance in Hong Kong excited some surprise."⁶ Later, in 1856, two were reported; in 1858 there was an epidemic in Victoria Jail (16 cases and 9 deaths); in 1860, 3 fatal cases in jail.⁷ During 1882 and 1883, Dr. Manson recognised cases in the Colony.⁷ From the above it will be seen that the disease was early recognised by the medical men at least as existing in Hong Kong. The presence of this disease in Hong Kong is a matter worthy of attention from a public health point of view, as it greatly affects the welfare of the Colony. An old resident at a public meeting in connection with a strike among the coolies is reputed to have said: "The prosperity of this Colony largely depends on the sturdy shoulders of the Hong Kong coolie."

NUMBER OF CASES.

Turning now to the number of beri-beri cases recorded in the out-patient and in-patient registers of the Alice Memorial and Nethersole Hospitals from 1888 to 1899 inclusive, the total is found to be 1,864; of these 1,547 were treated as out-patients, and 317 as in-patients. The average percentage for those years was 1.69; but in many years the percentage was higher. Thus in 1888 of 6,285 general cases, 140 or 2.23 per cent., in 1895 of 9,530 cases, 267 or 2.80 per cent., in 1896 of 9,303 cases, 205 or 2.20 per cent., and in 1899 of 11,954 cases, 428 or 3.58 per cent., had beri-beri. It will be observed from these figures that the percentage of beri-beri cases varied greatly from year to year, and notably the highest percentage was in 1899. In an article on "Beri-beri in Temperate Climates," the writer referring to China says, "There has evidently been a remarkable ebb in the disease in that country,"⁸ but this statement does not seem to accord with our experience in Hong Kong.

AGE OF PATIENTS.

The question of an age immunity is important. Referring to the ages of patients Dr. Wallace Taylor, Osaka, says: "The most susceptible age is from 16 to 28 or 32 (years). . . . I have never met with a case under 12 years of age, and from extensive inquiry have not heard of a case under 11 years. Children appear to enjoy an absolute immunity from kakké. I have never met with a case over 63 years of age, and am informed that it very seldom occurs over 60, and never over 65."⁹ Dr. Manson considers that beri-beri occurs at all ages except early childhood

and extreme old age.¹⁰ On investigation into the ages of beri-beri patients registered in the Alice Memorial and Nethersole Hospitals, we find that of 1,547 beri-beri out-patients and 317 in-patients, the average age of the former was 31·47 years, and of the latter 27·98 years, and of the whole 30·87 years. From statistics it appears that of 1,547 out-patients, 203 or 13·12 per cent., were 45 years of age and over; and of 317 in-patients, 22 or 6·94 per cent., were 45 years and over, i.e., of a total number 1,864 having beri-beri 12·07 per cent. were 45 years and over. The greatest age recorded was 77 years, and 13 cases were over 65 years, that is, 69 per cent. of the total beri-beri cases. Records show that out of the same number of beri-beri cases, 9 out-patients or 58 per cent., 15 in-patients or 4·73 per cent., that is, a total of 24 cases or 1·28 per cent., were 12 years of age and under. Thus while it is true that the majority of cases occur between the ages of 18 and 32, yet the fact that the youngest case is reported as 2 years of age, and the oldest as 77 years, seems to make it impossible to say that in Hong Kong there is an age immunity from beri-beri.

SEX.

The male sex is most commonly attacked, though among children girls appear to be more susceptible than boys, but it should be noted that to the Chinese mind boys are many times more precious than girls, and only rarely are boys left as in-patients in the hospitals. Puerperal cases occur in Hong Kong, but only one case has been noted among the in-patient obstetric cases in Nethersole Hospital. On enquiry at the "Tung Wah Hospital,"¹¹ the resident house surgeon said that in his experience he had seen about a dozen cases in about as many years. Statistics give the percentage of male to female beri-beri cases as 95·72 to 4·28. The usual proportion of male to female patients in attendance is as 4 to 1.

OCCUPATION.

The majority of the male beri-beri out-patients belong to the coolie class, whose work is carrying loads of rice, coals, bricks, &c. They are young, strong men coming from Canton, Swatow, Foochow, Amoy, Singapore and the Straits Settlements; the greater number of whom are obliged to live in lodging houses. These lodging houses are far from being pure and healthy, even though the number of occupants is regulated by law. The next most frequently attacked, according to the out-patient register, is the carpenter, and in this connection it is interesting to see in the *British Medical Journal* the result of investigations at Atjeh, in which it is stated, "Beri-beri patients can infect certain localities, and persons in good health coming from districts wholly free from beri-beri and settling in those localities become subject to the infection. . . . Wooden structures retain the infectious product more than stone buildings."¹² That wood left exposed may become saturated with noxious substances seems possible from remarks in the *Indian Lancet*¹³ on the hygienic aspect of wooden pavement. A block of wooden pavement which had been exposed to contaminating influences was found to have been permeated as a whole with pollution; so it may be possible that in the cutting up

of old and new wood these carpenters become in some way infected by beri-beri poison. Then in order of frequency (out-patients) come the sailors from their close bunks, the sedentary tailors from vitiated atmospheres, and the cooks from smoky kitchens. The last class of importance is that of barber. "Aseptic Barbering"¹⁴ is the heading of a leader in which is expressed the suspicion that even in Europe the barber may have something to do with spreading disease. A glance at the heads of Chinese patients is enough to convince one, that skin disease at least, is often conveyed from one individual to another through the medium of the Chinese barber. It would be difficult to estimate to what extent diseases of all kinds are propagated through the barber in China. The luxury of an "aseptic shave" by an aseptic Chinese barber is still on the far distant horizon! Should beri-beri be proved to be contagious as infectious, as is most probable, the fact that so many barbers have the disease may be an important factor.

Among in-patients about equal proportions of those suffering from beri-beri are sailors and coolies, then follow in order carpenters, cooks, tailors and barbers. The large proportion of sailors is due to the fact that captains of vessels send their men to hospital as soon as they are found unfit for work, whereas the average coolie has no money to pay his rice during a prolonged stay in hospital.

EFFECT OF CLIMATE.

It has long been thought that beri-beri depends to a certain extent on the climatic conditions present in a country. In Hong Kong we have to deal with beri-beri as it occurs under tropical conditions. During the earlier months, January to April, and later months, September to December, of the year, the rainfall is small. . . . To sum up my observations I conclude (1) that beri-beri cases are most frequent as a rule during the months of May, June, July, August, September and October; (2) that during the months of May, June, July, August and September the rainfall is greatest; and that (3) the temperature is greatest in May, June, July, August, September and October, or to put it generally, beri-beri is shown to be most prevalent during those months of the year in which the rainfall is greatest and the temperature highest.

MORTALITY.

The mortality from beri-beri in Hong Kong for 1899 was 202, while in the immediately preceding years the number was only 160 to 170; but this increase in the total number of fatal cases is probably due to the greater number of people attacked than to an increased rate of mortality from beri-beri. Looking back over the years 1888 to 1899 inclusive, the percentage mortality appears to vary greatly from year to year. As a rule only severe cases ask to be admitted to Hospital and considering the state of patients on admission the rate of mortality seems comparatively small. . . . The percentage mortality is found to vary from 0·00 per cent. in 1898 to 46·15 in 1896. In the years 1888, 1890, 1891 and 1898 the percentage fatal was below 10 per cent.; in 1892, 1893, 1894, 1895 and

1899 between 10 and 20 per cent.; in 1889 and 1897 20 per cent., and in 1896 it was 46.15 per cent. The average percentage fatal during years 1888-1899 inclusive, is probably a fair average mortality, viz., 15.45 per cent. Beri-beri appears therefore in some years to be a mild disease, which though causing great discomfort and loss of work yet results in little loss of life, while in other years the type is so virulent and the mortality so high that it is a disease to be dreaded. Many of the fatal cases had only been a few days in Hospital, having evidently been brought in a moribund condition. The majority of fatal cases were under forty years of age, making it evident that the young and strong man is most severely attacked.

BERI-BERI KNOWN TO CHINESE FROM EARLY TIMES.

Beri-beri is well known to the Chinese native doctors under the name (Keuk Hei, a term similar to the Japanese Kakké and meaning "breath in the feet.") In conversation with Chinese doctors and from their medical books, one learns their ideas on this disease. Beri-beri has been recognised for a thousand years and occurs chiefly in the southern provinces of China and the islands of the South Seas, but also in a lesser extent in North China. It is considered a dreadful disease, especially because its onset is so insidious that often before a man realises his danger his chest has become involved and then his case is well nigh hopeless. Men are warned to be careful as soon as they feel the movements of their legs less free, slightly prickly, numb, swollen and painful, bowels constipated, tip of the tongue affected and limbs and muscles inactive and weak. The six pulses are superficial, hard and full.¹² By taking timely heed to those symptoms he may prevent the disease rising to his chest. One writer gives many varieties of the disease according to the prominence of certain symptoms, *e.g.*, the disease with numbness, wind disease, &c. Another divides beri-beri into wet, dry and pernicious rheumatic beri-beri. The symptoms of wet beri-beri are swelling of legs, shining skin, dulness of the face, feeling of heaviness, distortion of taste sensation, pulse quick, soft and jerky. The symptoms of dry beri-beri, no swelling of legs but pain, pulse quick, soft and jerky. In pernicious rheumatic beri-beri the pulse is small, slow and soft, signifying anæmia and rheumatism; it may, however, be small and bounding or small and firm. The other symptoms of pernicious beri-beri are swelling of legs, cold sweating, laxity of bowel, loathing of food, sleeplessness, livid face and pale lips. Generally speaking, a case with swelling below the ankles is a mild case, on the legs a progressive case, on the thighs serious, in the abdomen dangerous and as soon as constriction of the chest is felt, the heart must be guarded. As it is possible, however, that beri-beri may be confounded with other diseases, a Chinese writer gives the following differential diagnosis:—Beri-beri and malaria have both the sensations of heat and cold, but malaria has the six systems deranged one after the other, while beri-beri has only a swelling of the legs; a patient suffering from paralysis is too weak to walk about and has no pain at all, a beri-beri patient, however, has tightness of skin and firmness of muscles. The rheumatic patient has great pain, which in a serious case runs

along the hands and over the body and will, after a long time, paralyse the thighs and the disease remains—unlike beri-beri, in which the pain is confined to the legs. The Chinese ideas of the causes of this disease are stated to be over-enjoyment of ease during early life, too much sitting, addiction to alcohol, relishing rice, accumulating bad humours or heat, and catching miasma in a foreign place which the patient has visited. In the south of China beri-beri is said to be prevalent in Spring and Autumn and the dampness is believed by all to be a great pre-disposing cause—but in the north of China, the people, by drinking alcohol to excess and a kind of milk whey, so damage the stomach and spleen that they cannot perform their functions and many are thus attacked by beri-beri. The Chinese themselves in treating this disease lay stress on three points: (1) change of residence, (2) change of diet, (3) medicine. (1) It is well known among the Chinese that if they are attacked by beri-beri in Hong Kong their best chance of speedy recovery lies in going back to their native places and living there for a time. A case was mentioned to me where a patient of beri-beri symptoms appearing each year during several years, immediately returned to his country home, but last year (1899) he died just before setting out for the country. In cases where it is impossible to leave Hong Kong the Chinese doctors recommend the patient to leave the ground floor and sleep upstairs to avoid damp. (2) The usual change in diet is to take beans or potatoes instead of rice. Articles forbidden are salt, geese, ducks, pork, mutton, flour cakes, eggs and indigestible foods—tonic drugs, vegetables, fruits, melons, cold soups. They recommend drinking mulberry tea and the use of pine wood water for washing. Medicines given are (1) Purgative *not* tonic drugs; (2) Rice worms (which are in season twice yearly) eaten with leeks and orange peel; (3) Turtles (male animals are best) to be eaten with leeks, but after eating if there is pain in the stomach, cause two or three motions and cure follows at once; (4) Cochcow powder, betel nut, orange peel, ginger and cinnamon as a prescription. (5) Cut off on a lucky day a piece of skin from the patient's arms and legs. Then judging that a "mind diseased" may be prejudicial to the patient, he is directed to "minister to himself." Let beautiful things be in the heart; Let there be almsgiving and heart examination to the full, then will the disease not come. If it has come examine yourself, if you have errors change, if none, do good more than before and cure follows. In their books there is much that is superstitious, but yet the symptoms are fairly accurate and the treatment in some respects on the right lines. So much for Chinese ideas on the subject.¹⁶

SYMPTOMS.

In Hong Kong beri-beri, like many other diseases, presents very varying symptoms. Side by side in a ward there may be two patients, one with wasted muscles, the other seemingly dying from dropsy, yet these two are known to be suffering from beri-beri. Turning to medical works on this subject it appears that each author endeavours to make a classification. Osler says that there are several types, but only gives definite name to one—"Acute Pernicious Beri-beri,"¹⁷

though he describes the symptoms of other types. In Pekelharing and Winkler's treatise (Cantlie's translation) many names are mentioned and discussed, among which are "The Destructive Kakké of Wernich,"¹ "Convulsive Beri-beri,"² "Polysarcous Beri-beri" (Duderhoven).³ It is difficult to decide what classification these two authors favour, as they desire to insist on the fact that a case may belong at one time to one class and at another time to another. They, however, for convenience in description, use the terms sub-acute or dropsical atrophic form,⁴ sub-acute convulsive form,⁵ atrophic form,⁶ cedematous form,⁷ and mixed form.⁸ They object to the term "acute" as they hold that beri-beri is a disease⁹ of a typically chronic form and it is only in appearance that it presents itself under an acute form while entering on a new phase.¹⁰ Dr. Manson describes paraplegic and dropsical cases and mixed paraplegic and dropsical cases.¹¹ Paralytic atrophic cases are designated by him dry beri-beri or beri-beria atrophica, wet beri-beri or beri-beria hydrops, and those in which there is a combination of both conditions, mixed beri-beri.¹² He further classifies cases according to rapidity of development and severity of symptoms into acute, sub-acute, and chronic.¹³ But, as has been often shown, a case may at one stage be "dry," at another "wet," and at another "mixed;" so that in saying that a patient is a good type of this or that form of beri-beri one can only mean that at the time of examination the patient suffered from beri-beri of "wet" type or "dry" type or "mixed" type. In Hong Kong, as far as my experience goes, the majority of cases are of the dry atrophic and mixed types when they come for treatment—cases of dropsical type do come, but not nearly so frequently.

NOTES AND REFERENCES.

¹ "Papers on the subject of the prevalence of Beri-beri in Hong Kong" (published by Noroaha and Co., Hong Kong, 1889), p. 7.

² *Ibid.*, pp. 1, 2.

³ *Ibid.*, p. 3.

⁴ *Ibid.*, p. 5.

⁵ *Ibid.*, p. 6.

⁶ *The Hong Kong Government Gazette* for 1888, p. 597.

⁷ Papers on the subject, "Beri-beri in Hong Kong," p. 7.

⁸ *British Medical Journal*, September 24, 1898, p. 872.

⁹ "Studies in Japanese 'Kakké,' or Beri-beri," by Wallace Taylor, M.D., 1886.

¹⁰ "Tropical Diseases," by Patrick Manson, M.D., p. 232.

¹¹ Native Hospital.

¹² *The British Medical Journal*, December 4, 1886, p. 1,115.

¹³ *The Indian Lancet*, November 1, 1897, p. 454.

¹⁴ *The British Medical Journal*, January 6, 1900, p. 37.

¹⁵ The Chinese native doctors describe six pulses, viz., "Tsun" pulse right and left, "Kwan" pulse right and left, and "Chek" pulse right and left, which they count from below upward from the wrist. The right "Tsun" pulse indicates the state of the lungs and diaphragm, the left "Tsun" pulse the state of the heart and pericardium. The right "Kwan" pulse shows the condition of the stomach and spleen, the left "Kwan" pulse of the liver and gall bladder, small intestine and left kidney. The pulses are examined by placing the index, middle, and ring fingers of the right hand on the patient's left wrist, with the index finger next the wrist, then the index finger determines the left "Tsun" pulse, the middle finger the left "Kwan" pulse, and the ring finger the left "Chek" pulse. To feel the right pulses the native doctor uses his left hand on the patient's right wrist in a similar manner, thus determining the condition of the right "Tsun," right "Kwan," and right "Chek" pulse.

"These facts have been gathered from conversation with Chinese native doctors, and three Chinese medical books on Beri-beri.

¹⁶ "The Principles and Practice of Medicine," p. 838.

¹⁷ "Beri-beri," by Pekelharing and Winkler, translated by J. Cantlie. Pentland, Edin. and Lond., p. 14.

¹⁸ *Ibid.*, p. 22.

¹⁹ *Ibid.*, p. 5.

²⁰ *Ibid.*, p. 22.

²¹ *Ibid.*, p. 34.

²² *Ibid.*, p. 45.

²³ *Ibid.*, p. 33.

²⁴ "Tropical Diseases," by Patrick Manson, M.D., p. 223.

²⁵ *Ibid.*, p. 232.

(To be continued.)

AN ENEMA FOR CHRONIC DYSENTERY.—Delioux de Savignac (*Journal des praticiens*, January 12) recommends the following formula:—

R	Tincture of iodine	...	10 to 20 drops.
	Potassium iodide	...	7½ grains.
	Water	...	8 ounces.

M.

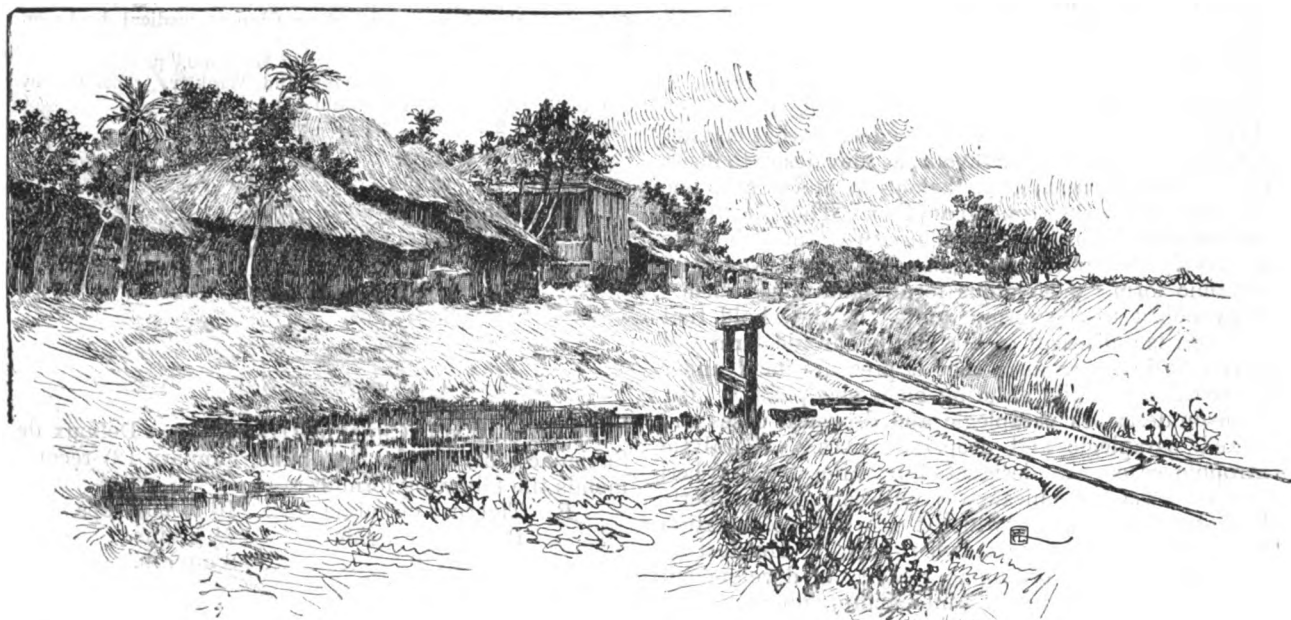
BLOOD-LETTING IN HEATSTROKE.—Carl Klein relates the case of a stoker on an American liner who suffered from heatstroke, and became convulsed. The man was "saved" by the abstraction of seven ounces of blood. Klein recommends this treatment to the notice of military surgeons.—[*München Med. Woch.*, 27 of 1900.]

THE MOSQUITO THEORY OF THE TRANSMISSION OF YELLOW FEVER, WITH ITS NEW DEVELOPMENTS. By Dr. Charles Finlay. — When the *Culex mosquito*, *fasciatus*, is confined in an atmosphere artificially rarefied to correspond to altitudes of from four thousand to six thousand feet, it is unable to fly, at least for a while, or to sting. It seems unlikely, considering the smallness of this mosquito's wings, that it will of its own accord, fly to any considerable height or distance, especially when weighted by the blood which it has absorbed. These peculiarities, according to the author, agree with what is known about the propagation of yellow fever, its tendency to invade the lower stories of buildings in preference to the upper ones, and its non-transmissibility in places like the City of Mexico, Puebla, Petropolis, situated at considerable altitudes above the sea level. The U.S. Army Yellow Fever Board has placed beyond a doubt the fact that the *Culex mosquito*, *fasciatus*, does transmit the yellow fever from a patient to non-immune persons perfectly isolated from other sources of infection, and, it has undertaken to demonstrate experimentally the fact, that, other sources, to which the yellow fever infection has been hitherto attributed, are absolutely incapable of determining an attack of the disease.—*Medical Record*, January 19, 1901.

Miss Lillie E. V. Saville, M.D., on whom the King has been pleased to bestow the decoration of the Royal Red Cross in recognition of her services at the International Hospital during the siege of the Legations at Pekin, is the daughter of the Rev. A. T. Saville, Congregational Minister, Rye.

Illustrations from the SPECIAL MALARIA NUMBER OF THE "PRACTITIONER," March, 1901,
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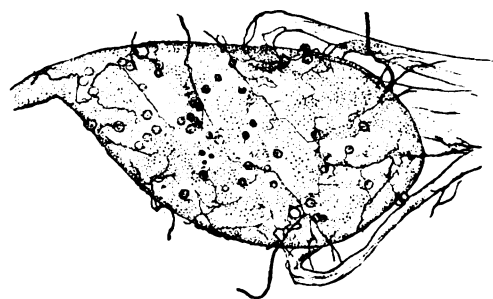
(See leader in this issue.)



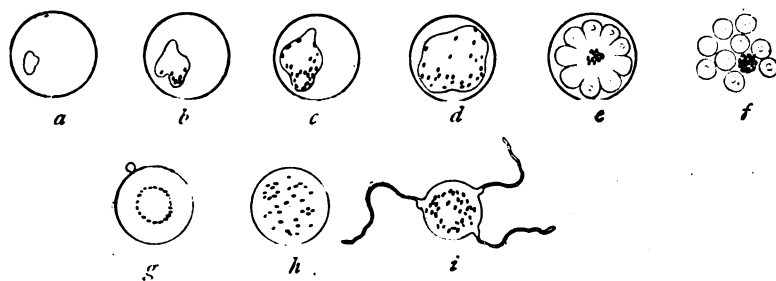
Anopheles-infected pool; originally a "burrow hole" made during railway construction, Sierra Leone. (Ross.)



Anopheles-haunted, slow-running drainage canal near Ostia.

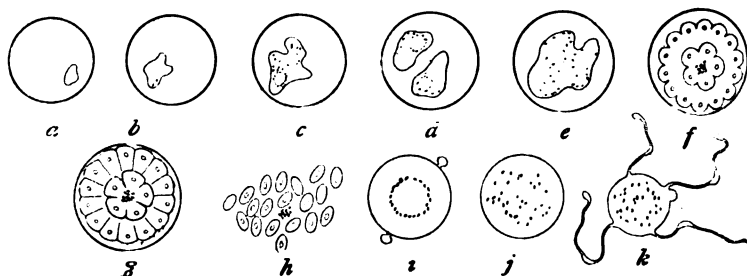


Stomach of Anopheles showing zygotes; heavy infection. (From a photomicrograph by Dr. C. W. Daniels.)



Quartan Malaria Parasite. *a* to *d*, amœbulæ; *e* and *f*, sporocytes; *g*, macrogametocyte (female); *h* and *i*, microgametocytes (male).

Tertian Malaria Parasite. *a* to *e*, amœbulæ; *f*, *g* and *h*, sporocytes; *i*, macrogametocyte (female); *j* and *k*, microgametocytes (males).



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THE

Journal of Tropical Medicine

MARCH 15, 1901.

SPECIAL MALARIA NUMBER OF THE PRACTITIONER.

THE *Practitioner* for March, 1901, is devoted entirely to malaria and the result is a record of paludism in all its bearings. The *Practitioner* may not be so well known to medical practitioners in the tropics as it is to those at home, and the usual topics of its contents may not specially or directly interest dwellers in the tropics. The March number is an exception and we would recommend every practitioner in the tropics to secure a copy of the Journal. It may seem foreign to the purpose of one journal to recommend another—a rival in its province of medicine, as it would appear—but we deem it for the benefit of the profession to let this publication be widely known, and we have advised Messrs. Cassell and Company, La Belle Sauvage, London, E.C., to keep the March number of the

Practitioner in type for at least two months, so that the sufficient time is allowed for orders for the Journal to come in from the more distant parts of the tropics.

A mere mention of the names of the writers in this special number is a sufficient guarantee of the excellence of the Journal in question. Dr. Patrick Manson, C.M.G., F.R.S., discusses the "Ætiology, Prophylaxis and Treatment of Malaria" in his usual masterly manner; D. C. Rees, Medical Superintendent London School of Tropical Medicine, gives a categorical account in a thoroughly scientific spirit, of "Malaria: its Parasitology, with a description of Methods for Demonstrating the Organisms in Man and Mosquito." Dr. Louis W. Sambon, Lecturer to the London School of Tropical Medicine, a "hero of the episode" of the mosquito-malarial-proof hut in the Roman Campagna during the summer of 1900, deals in an exhaustive fashion with "The Intermittent Fevers and Blackwater Fever." On these subjects no one is entitled to be listened to with greater respect than Dr. Sambon, and his statements and writings are at all times set forth with an accuracy and weight of argument which are calculated to carry conviction. Lastly, Mr. Ernest E. Austen, of the Zoological Department, contributes a carefully prepared and original paper on "The Genus *Anopheles*." An addendum by Dr. Sambon, termed "A Medico-Literary Causerie," being the history of malaria, is perhaps the most fascinating chapter of all. With true respect for the work of early investigators and a thorough acquaintance with the literature of all that appertains to malaria from the earliest times, Dr. Sambon gives a vivid picture of the "fearful struggle between man and malaria."

A very excellent review of Tropical Diseases, by Dr. R. Tanner Hewlett, M.D., M.R.C.P., Physician to the Seamen's Hospital, Greenwich, and Bacteriologist to the Jenner Institute of Preventive Medicine, appears at the end of the Journal. We do not propose to give extracts of these important papers, but we would wish and advise every one interested in tropical medicine to get the current March number of the *Practi-*

tioner, to keep it as a text-book and to have it as a reference on the subject of malaria and as a record of our knowledge of the subject of paludism, at the beginning of the twentieth century. The articles are beautifully illustrated and we are indebted to Messrs. Cassell and Co., for permitting a few of the illustrations to appear in this Journal.

Translation.

ON THE VALUE OF DANYSZ'S MICROBE FOR DESTRUCTION OF THE RATS IN DRAINS.

By Dr. MÉNELAS SAKORRAPHOS, ATHENS.

(Translated by P. Falcke.)

In the *Annales de l'Institut Pasteur*, of April, 1900, Danysz states that rats die from the infection of a coccus-bacillus which he describes as presenting on the whole the appearance of the bacillus coli. The Sanitary Commission of Greece, through its President, Mr. Kadsimichalis, had cultures of this coccus brought to Greece direct from the Pasteur Institute.

The following is a brief exposition of the results of our own experiments:—

Having convinced ourselves that the cultures were still living, we commenced our experiments according to Danysz's method. (a) For the first experiment, ten rats, caught in the drains of Athens, were put into cages and fed with this culture, mixed with bread and water and a little salt, while during the following days we gave bread and cheese. On the fifth day a rat died, and we left the body in the cage for thirty hours, but none of the survivors attempted to devour it. On dissecting the rat, characteristic lesions were found in the spleen and intestines. The pathogenic microbe was isolated from the blood of the spleen and cultured on gelatine. (b) Two other rats fell ill, but they recovered; and on the twentieth day, being convinced that all the animals were in good health, we commenced a second experiment. Two other rats were removed into the same cage. Meantime we had prepared some fresh cultures, and separating the rats into two cages, we gave those in one cage stale cultures, and those in the other cage fresh cultures. Two animals died between the eighth and tenth days, and one was dissected, with positive results. The other was left in the cage in which all the other rats had been placed, but they did not devour the body. The survivors remained quite healthy. (c) Twenty days after, we made the third experiment. One rat died, and notwithstanding the fact that the survivors were fasting, only the tail was eaten. It must be added that, as the virulence of the microbe is increased when culture is isolated from the blood of an animal killed twenty-four hours' subsequent to the ingestion of cultures, we cultured direct on gelatine the blood of a rat killed after that time. When the cultures had multiplied

we attempted a third experiment, but notwithstanding, we obtained no results but the partial gnawing of one animal. As the result of our experiments, we came to the following conclusions:—

(1) That the microbe is not sufficiently virulent, at least as regards the rats of the drains in Athens.

(2) Even supposing that the mortality be augmented, the means suggested for the destruction of rats, in drains and other localities infested by them, is not efficacious, seeing that the survivors do not devour the dead bodies which have been infected by the pathogenic microbe of Danysz.

THE SIEGE OF PEKING—ITS MEDICAL ASPECTS.

By LILLIE E. V. SAVILLE, M.D.

Extracts from an article in the China Medical Missionary Journal, for January, 1900.

On June 21, the International Hospital was organised in the British Legation; Mr. Cordes, who was wounded at the time the German Minister was killed, and a young Russian student with a penetrating wound of the left shoulder-joint, being the first patients. Miss Lambert, a nurse connected with the S. P. G. Mission, was asked to take charge of the nursing arrangements; Dr. Poole, of the British, and Dr. Velde, of the German Legation, were the staff. The women doctors were asked to act as nurses, which we gladly did; Drs. Leonard, Mackie and Martin taking charge at night, while Dr. Gloss and I divided the day between us, and we were fortunate in getting a good deal of the surgical work, dressings, operations, anæsthetics. There were two trained nurses and other ladies also to help.

Those of us who had had to leave our homes at an hour's notice had of course very few drugs, and no dressings. The British Legation was poorly stocked, Dr. Poole had only just come out; fortunately, Dr. Velde had a large supply, all of the German army type—iodoform gauze tied up in little packets, very compressed, to be cut into strips, white muslin gauze squares, about 5 in. by 5 in., folded and compressed into another very small package. He had also a steriliser, which had to be used later when muslin curtains took the place of the white gauze, and bags of peat or saw dust that of wool. Instruments were always sterilised for operation.

To most of us the experience of shot and shell wounds was new, and we had much to learn. The hospital first occupied two rooms in the Chancery bungalow, but gradually, as the number of wounded grew, we had to take over more rooms, till finally we had an operating room with two tables, five wards, three beds for five patients in the hall, and a convalescent ward for officers and civilians in Lady Macdonald's house, and another for the marines elsewhere. Three American ladies superintended the kitchen and stores; these were beyond all praise. Of course the hospital had first claim to commissariat stores, but nowhere else was there such fragrant pony soup, such really eatable mule stew; and I think the officers and men often thought it was worth

while to be *slightly* wounded to get a few days good feeding.

Owing to the difficulties of "diverse tongues" the men were "warded" wherever possible, by nationality; at any rate, no man was in a room where he could not talk to some one. Italians and French were together, with a French sister in charge; Russians in another room, where they were most tenderly cared for by Madame de Giers herself,—the Minister's wife, with them Germans were often put, one room was always full of the bright interesting little Japs. English and Americans naturally went together. There was one ward for officers and civilian volunteers, and here we nursed British, American, German, French, Italian, Austrian, Dutch, Australian and Russian. It was wonderful how our stores and supplies came in; beds and bedding, shirts and all that was necessary. They represented very much self-denial on the part of others and exhibited many expedients. The under pillows were made of straw from the picking of wine bottles, eiderdown quilts were cut up for soft pillows, a long piece of Chefoo silk, found in the Mongol market, made shirts, as did best damask linen and bright yellow cotton. "Imperial" shirts these were called. There were very few bedsteads; mattresses were placed on the floor, but every man did have a mattress from somewhere, also sheets and pillows.

Some of the marines had first aid dressings in their haversacks, but by no means all; and I believe the civilian volunteers had none, so that on admission to hospital the wound was just as it had been received. It was first examined as to entrance and exit points; the parts around washed and then a plugging of iodoform gauze lightly pushed in, or if penetrating, pushed clear through. Very rarely was there any examination of the interior, even if no wound of exit were present. The bullet was rarely hunted for at the first dressing. Over the wound were doubled up several pieces of the white muslin squares, then a pad of wool, and then a bandage. The hæmorrhage used to surprise me very much indeed; dressings were soaked in an hour or two, and packed again and again. At the second dressing, from the third to the seventh day, one saw that the thick firm coating of congealed blood was the best air proof medium that could have been devised. Our great enemies were flies; we had a plague of flies! but more of them anon.

The character of the wounds was not that of open warfare, for the fighting was all behind barricades. Consequently the proportion of head injuries was large. Three penetrating wounds of head did well, though two had facial paralysis, and one required to have enucleation of right eye. Mr. B., an Austrian lieutenant, had a bad shell wound of the vault. About 2 by 2 in. of bone was removed, and dura mater exposed and brain. There was very severe hæmorrhage from the longitudinal sinus, but he did remarkably well, and in about a fortnight left the hospital as a convalescent patient. As a good deal of pus began to well up from the wound, it was decided to operate, and the opening was enlarged by chisel; some pieces of dead bone and of lead were removed. He came round from the anæsthetic smiling and con-

tented as usual as if he had wakened from a nap, and in a few days was up and about again. The day of the relief he went out as a convalescent, and as the wound did not require frequent dressing, was not seen for two days. He was brought back with a temperature of 104.5° F.; was very restless and delirious, and next day developed a purpuric rash on the hands, which quickly spread to trunk and limbs. A diagnosis of typhus was made, which gave place later to one of meningitis. He had to leave the British Legation when the hospital was broken up, but I heard from Dr. Velde a fortnight later that he had recovered completely and left Peking. The after-history of the case will be interesting.

There were several severe wounds of shoulder, and more so of elbow joint. In one case the bullet entered the outer side of right arm, passed probably through the shoulder joint into the lung. The patient had some cough, hæmoptysis and orthopnoea, and for a time was very ill, and then began to improve rapidly, and the lung symptoms passed off. Some weeks later he complained of pain on the right side just outside the level of the seventh and eighth dorsal spines, but there was no definite tenderness, nor physical signs indicating the presence of a bullet.

Secondary operations undertaken on account of symptoms often disclosed bits of material—shirt or trouser—which had been driven into the wound, or the missing bullet or fragment of shell. But the proportion of shell wounds was small; one of face was fatal. The piece of shell had passed through the right side of face, leaving only a narrow strip of natural tissue between entrance and exit. The lower jaw was almost all gone, the upper maxilla shattered. The wounds were attended to and patient put to bed, but shortly it was found that the arch of the palate was practically gone, the fragments above pressing in the glottis and producing asphyxia. I had my fingers in the mouth holding up the plate while tracheotomy was rapidly performed; anæsthesia was not required, and the patient died two hours later.

There were three perforating wounds of larynx. One died before the tracheotomy was completed, another on the second day, the third did splendidly, recovered his voice and returned to slight duty before the siege was over.

Two cases of compound fracture of tibia developed tetanus. The first, a German, complained on the morning of the fifth day of severe occipital pain, and by noon trismus was well marked, and after two days of intense suffering for himself and for those who watched him, he died. He had large doses of *chloral* and *bromide of potassium*, and *morphine* hypodermically. The wound was not foul.

The second case was Mr. N. of the Japanese Legation. In his case there was no wound of exit. On the second day it was found that flies had got under the upper layers of bandage and freely laid their eggs, and this although he had had his wife's private nurse constantly with him to fan. The bandages were removed and the dressings underneath the splint found to be quite clean; the limb was carefully washed with creolin and the splint reapplied, and he was moved into another bed with fresh bedding. Odour from the wound was noticed next

day, and though the dressings were frequently changed the discharge became most foul. On the ninth day it was decided to explore for the bullet. He did not take the chloroform well; breathing was irregular and peculiar in character; in fact I remarked it was as if he had diphtheretic diaphragmatic paralysis. The bullet was found, and a counteropening made for drainage. For the next two days he complained of being very tired, disinclined to talk and refused food; finally saying it was because his teeth would not bite. This was found to be the case, but there was no difficulty with swallowing. Gradually he developed slight tonic contractions; first of hands, then trismus, but never very marked. There were one or two attacks of opisthotonos just before death, which occurred four or five days after operation. He had chloral hydrate, gr. xxx., four-hourly as long as he could swallow and hypodermic injections of morphia.

We had an exciting case of strychnine poisoning. A Russian had taken "a little" from a small bottle looted from the store, thinking it to be bicarbonate of soda. He was said to have vomited ten minutes after. When seen in the hospital, probably half an hour later, 9.30 a.m., he was comatose, breathing stertorous, opisthotonos and convulsive twitchings all over. Chloroform inhalation was commenced at once and administered continuously for two and a half hours. As soon as relaxation occurred at all efforts were made to pass the stomach tube. Though for a long time unsuccessful they provoked very free vomiting, and when the tube was at last passed the stomach was well washed out. At noon the limbs were fairly relaxed, and only trismus was marked, with occasional convulsive seizures and opisthotonos. The moment these re-commenced chloroform was started again. By three o'clock the attacks were only half-hourly, and after 4.45 they ceased, and he was able to drink. He seemed anxious to sleep and very thirsty. The next morning he got up and dressed, and the following day returned to duty.

Towards the close of the siege several were invalidated with diarrhoea and dysentery; there were two deaths from the latter among the Russians, but they were known to be exceedingly careless about their drinking water. We had three cases of typhoid, one of whom died after his removal to Tientsin. During the siege we had no death in hospital of any who had survived his injury twenty-four hours, except the two cases of tetanus. There have been two since—one a penetrating wound of pelvis, which became very septic with a good deal of diseased bone-ilium, and one bullet wound of head with extravasation of brain matter—the bullet not extracted.

No notes of cases were kept during the siege; this was a cause of great regret, but no one had the time; we kept the barest statistics, a summary of which I enclose. Pei-t'ang is the Roman Catholic Cathedral which was distant some four miles from us, and also in a state of siege. Explosion from mines is responsible for most of their casualties.

This is the merest sketch, and from memory; I have no data. The unity which was such a striking feature of the siege in Peking was nowhere more manifest than in the International Hospital. Differences of nationality, creed and professional status

were laid aside, and all worked with much happiness together.

CASUALTIES DURING THE SIEGE IN PEKING.

June 20th to August 14th, 1900.

			Killed and died of wounds		Wounded		Carried off	Died of Disease		Volunteers		Total	
	Officers	Men	Officers	Men	Officers	Men	Per Cent.	Officers	Men	Killed	Wounded	Killed	Wounded
A. LEGATIONS.													
American ..	3	53	7	2	8		30.3			1		7	11
Austrian ..	5	30	1	3	3	8	42.8					4	11
British ..	3	79	1	2	2	8	28.1			3	6	5	26
French ..	3	45	2	9	37		100.0			2	6	13	42
German ..	1	50	12	15	54.9		54.9			1*	1†	13	16
Japanese ..	1	24	5	21	104.0		104.0			5‡	8	10	29
§ Russian ..	2	79	4	1	18		28.3	2		1	1	7	20
Italian ..	1	28	7	1	11		65.5					7	12
Total ..	19	388	4	49	9	136	48.7	2		12	23	67	167
B. PEITANG.													
French ..	1	30	1	4	3		41.9					5	8
Italian ..	1	11	6	1	8		83.3					6	4
Total ..	2	41	1	10	1	11	53.3					11	12
Grand Total ..	21	429	5	59	10	147	49.1	2		12	23	78	179

NOTES.—Wounded means incapacitated for duty, not simple wounds which could be dressed and the men sent back to duty. Number of French wounded seems large, because they included all wounds, whether incapacitating for duty or not.

* Baron Von Kettler.

† Mr. Cordes.

‡ Captain Ando.

§ Includes Cossacks of Legation.

Reviews.

NEUE GESICHTSPUNKTE ZUR VORBEUGUNG DER TROPEN-KRANKHEITEN, MALARIA, DYSENTERIE, &c. (New points of view for the prevention of tropical diseases, malaria, dysentery, &c.). By Dr. H. Breitung. Otto Borggold, Leipzig, 1900.

The author's views are entirely one-sided, but his opinions are decided and his suggestions merit attention from the practical point of view.

The author considers that the prophylaxis and treatment of malaria are inadequate, and that quinine and phenocol do not answer the purpose for which they are intended. Dr. Breitung, moreover, suggests that "the initial cause of malaria consists only in the chemical processes of decomposition of the blood." The blood becomes overloaded with urea, nitrogen, and carbonic acid, and there is a daily loss of blood-alkalies, &c., through secretions of perspiration and urine, besides alteration of the hæmoglobin of the red corpuscles, and loss of chloride of lime, silicates, and other mineral products from the blood. To correct these conditions the author recommends a certain "hygienic tropical salt" composed of "Baden salts," &c., which is supposed to "ensure to the blood serum its normal constituents." He also recommends a "tropical tonic" composed of formic acid and sulphate of iron, he advises a particular diet, mostly vegetables, and forbids the use of alcohol. The care of the skin is of the greatest importance; thirst may be alleviated by sponging the body and extremities in cool vinegar and water.

L'ENSEIGNEMENT DE LA PATHOLOGIE COLONIALE A L'ECOLE DE MEDECINE D'ALGER. (Instruction in Colonial Pathology at the Algiers School of Medicine.) Dr. A. Brault, Professor of Tropical Pathology, commences his work by a short preface on the importance of tropical pathology as an independent science which has been developed as commerce has extended its far-reaching influence.

Dr. Brault gives an account of the course of study of tropical medicine at the Medical School of Algiers. The term of instruction is divided into two years. The first year is devoted to bacteriology, and the second year to diseases caused by animal parasites; to climate and its influence on health; to intoxications, including snake-venom and arrow poisons; also to diseases the nature of which are still unknown, such as:—Kala-azar of Assam, flood fever of Japan, yepieng of Corea, &c., &c. A course of lectures and demonstrations of microscopical preparations and lantern slides are given in connection with the instruction on tropical diseases. A well-appointed laboratory for bacteriological research has been provided and a stable for animals required for investigation.

Dr. Brault deplors the fact that there is no hospital in connection with the school, so that the education might be practical as well as theoretical. He calls attention to the London School of Tropical Medicine, and the principles on which it is conducted, and suggests that there would be great advantage in founding in the French capital an institute for the study of exotic diseases, with particular facilities for becoming acquainted with the bacteriology, parasitology, internal diseases, skin diseases and surgery of tropical countries.

HYGIENE ET PROPHYLAXIE DES MALADIES DANS LES PAYS CHAUDS, L'AFRIQUE FRANCAISE. (Hygiene and prophylaxis of diseases of warm countries, French Africa.) By J. Brault. J. B. Baillière & Son, Paris, 1900.

This book, though mainly intended for the doctors in the French Colonies of Africa, will be found a practical and useful work for all those interested in the subject. It is divided into three parts.

Part I. deals principally with the climatology of tropical and sub-tropical Africa, acclimatisation, colonisation, and hygienic measures to be adopted to ensure health.

Part II. deals with the particular African diseases due to animal parasites, among which the author includes *craw-craw*, negro lethargy, *goundou*, &c.

Part III. is devoted to the medical geography of the French possessions in Africa (W. and E. Africa, Algiers, Tunis, &c.), and takes into consideration the climatology, fauna and flora, pathology and other kindred subjects.

Algeria is becoming so fashionable a resort for Europeans that any information concerning the climate and diseases of the country is of great practical importance. We look to so eminent an authority as Dr. J. Brault, the author of this book, for good work; and the care and consideration given to the preparation of the book at once commend it to notice. So many invalids and persons desirous of escaping the rigors of a northern winter or the vagaries

of the British spring, now prefer Algeria to the Riviera, that apart from the scientific value of this work the information it contains is of considerable value.

Current Literature.

BORRAS FEVER.

DR. FRANCISCO MULLER, of Havana, presented a communication in which he held that there was no distinct pathological entity called "borras fever," as held by many Cuban physicians, but that what was called by this name might be either yellow fever or malaria or typhoid fever. He described these three types, and showed that they could not be classed as one disease, but that their symptoms corresponded to those of the three fevers mentioned.

DR. J. R. AVELLANAL, of Bejucal, Cuba, said that he fully accepted in the solution of the problem of borras fever, the action of the three great pyrexias, malaria, yellow fever, and typhoid fever. He did not consider of much importance the arguments brought forward in support of the theory that borras fever was a disease *sui generis*, and indeed a careful study of the symptoms of the various types led to the conviction that this theory was incorrect. The absence of the malarial parasite in certain cases did not prove that it might not be present in others, and it was not always possible to obtain Widal's reaction in the typhoid form, since this was an aborted typhoid which ran its course in less time than was needed to obtain this reaction. Whatever doubts there might be as regarded diagnosis, the treatment of borras fever, so called, was simple enough, consisting in the administration of quinine together with antiseptics and evacuants.—*Pan-Amer. Congress, Med. Record*, February 25.

CAVITE FEVER.

WRIGHT describes the form of a disease which seems to be endemic in certain localities of the Philippine Islands, characterised by abrupt onset, high temperature, severe muscular pain, extremely painful and tender eyeballs. The predisposing causes are high temperature, low damp localities, overcrowding, and possibly the nearness to salt water. The exciting cause is supposed to be microbic, though it is as yet unknown. No deaths have occurred and the pathology is obscure, but the author seems to think it due to a toxic peripheral neuritis. The disease is most apt to be confused with dengue, but the absence of an afebrile period and rash enables one to differentiate it from that disease. The absence of catarrhal symptoms separates it from epidemic catarrh. The treatment is rest in bed, with liquid diet, free opening of bowels and cold-tar antipyretics and quinine. In some cases it has been followed by local atrophy and paralysis.—*Journ. Amer. Med. Assoc.*, February 23, 1901.

MADURA FOOT.

DR. C. M. DESVERNINE and A. DIAZ ALBERTINI, of Havana, reported two cases of madura foot occurring in Cuba. One of the patients and the amputated foot of the other were shown to the section. The parasite (*Streptothrix madurae*) was described and preparations of the same were exhibited.

DR. THOMAS N. CALNEK, of Jan José, Costa Rica, said that he had seen many cases of this disease in Costa Rica, where it was generally confounded with elephantiasis. He believed the disease was curable in the early stages when the nodules were small. Elephantiasis was rare, but madura foot quite common in that country.

DR. DEBAYLE, of León, Nicaragua, had seen many cases, the disease being not at all rare in that country.

DR. MORENO, of Havana, did not think that the absence of filaria in suspicious cases should be held to negative the diagnosis of elephantiasis.—*Pan-Amer. Congress, Med. Record*, February 25, 1901.

PLAGUE.

SOME OBSERVATIONS ON PLAGUE AND ITS TREATMENT WITH LUSTIG'S SERUM.

By DR. H. N. CHOKSY, BOMBAY.

(Reprinted from Vol. IV., *Bombay Med. and Phys. Soc. Trans.*)

TYPES OF PLAGUE.—Dr. Choksy divides plague cases for clinical purposes into seven types. (1) Pestis minor, (2) pestis ambulans, (3) simple bubonic, (4) septicæmic, (5) pneumonic, (6) cellulo-cutaneous (7) non-typical forms. Of these the cellulo-cutaneous is the only interpolation, it is described as a "cellulo-cutaneous necrosis, large necrotic patches involving the skin and the sub-cutaneous cellular tissue."

The clinical phenomena that manifested themselves after the injection of serum, were: moderation in the intensity and duration of fever, improvement in the state of the circulation as shown by increase of arterial pressure, diminution in the size of, and lessening of pain in buboes, cessation in the progress of advancing lymphatic infection, clearing of the mental faculties, and a general improvement in the condition of the patient.

PRELIMINARY CONCLUSIONS.

The following preliminary conclusions were deduced from the above observations:—

- (1) That the serum exerted a distinctly favourable influence on the course of plague.
- (2) That where it failed to avert death, it prolonged life, and temporarily ameliorated the condition of the patient.
- (3) That it did not exert much effect in those types of plague that are characterised by an extremely high mortality rate.
- (4) That its application therefore was mainly, though not exclusively, limited to the bubonic type of plague.
- (5) That there were limitations to its use in hospital practice, as about 50 per cent. of all admissions die within forty-eight hours, 20 per cent. recover naturally,

and there remain about 30 per cent. that can be influenced by the serum treatment.

(6) That its use would be more effective in private practice, as early cases would be treated, and that encouraging results, giving a recovery rate of 59·37 per cent. in 32 patients, have been obtained up to now.

(7) That it exerts no deleterious influence on the patient, and could be injected into the healthy not only without any ill-effects, but with positive good, as it is capable of conferring *immediate but temporary immunity* against plague; this immunity may last from ten to fifteen days.

OTOMYCOSIS IN THE TROPICS, by H. Campbell Highet, C.M., M.D., Physician to the Royal Palace, Bangkok.—Otomycosis, or the growth of fungus in the external auditory meatus, is apparently a rare disease in temperate climates, if one may judge from the scanty literature on the subject. During eight years' work in Singapore and Bangkok, however, my experience has been that it is quite a common—if not the most common—disease affecting the external auditory meatus which one meets with in the tropics. The reason for this appears to be that all the conditions favourable to the growth of fungi are present—namely, heat, moisture, and the presence practically everywhere in abundance of the spores of the fungi. All my cases were in adult Europeans. Children are said to be exempt from the disease.

Symptoms.—These vary in intensity according to the severity of the case. There may be simply a sensation of blocking of the ear with slight impairment of hearing. Itching, pain, and often a considerable amount of watery discharge, is complained of, and the patient notices that his pillow has been stained during the night by a yellowish fluid which he finds exuding from one or both ears. Both ears are usually affected, but often in different degree. When an attack of acute diffuse inflammation of the meatus supervenes, as is unfortunately a frequent complication, great pain and sleeplessness follow, and often a considerable rise of temperature is noted for a few days.

Physical Appearances.—In typical first attacks the meatus is seen to be filled up with a soft wool-like substance which varies in colour, according to the type of fungus present. As I have seen it, it is usually of a pale lemon yellow or a very pale yellowish green. On passing a probe into the canal, the obstruction is found to be soft and moist and is readily removed. The walls of the canal may be found to present quite a normal appearance, but as a rule they are somewhat reddened, and the irritation may have gone as far as to have led to some desquamation of the epithelium. In cases in which the attention of the patient has been suddenly drawn to his ears by an acute attack of pain and deafness, it will be found that there are signs of extension of the catarrh to the middle ear. In chronic cases, besides the soft masses of recent fungus, impacted masses of a material like sodden newspaper are found in the meatus. These come away in large scales, or even casts of the canal, and the walls are found to have undergone thickening, so much so as in some cases to hide the tympanic membrane. Microscopical examination of the fungus

reveals the presence of such common fungi as the *penicillium glaucum*, *aspergillus*, and more commonly in my experience the *mucor mucedo*.

The Complications noted in my cases were diffuse inflammation of the external auditory meatus, acute serous catarrh of the middle ear, chronic catarrh of the same, perforation of the membrana tympani, swelling and even abscess of the lymphatic glands at the angle of the jaw, and eczema of the meatus and pinna. The acute adenitis, the result of septic infection from the ears, was so severe in one case as to require the administration of chloroform on two separate occasions in order to open abscesses on either side of the neck.

Diagnosis is usually easy, and is at once settled by the microscope.

Prognosis.—This is a readily curable disease, but is only so if the case be taken charge of by the physician himself. To hand over the details of treatment to the patient is a plan which leads to much trouble and disappointment. I have known of cases going on for weeks and even months when carelessly attended to.

Treatment.—As much of the fungus as possible should be removed with a cotton and probe, and then the canals should be well syringed with a warm solution of bichloride of mercury (1 in 5,000). The canal is then thoroughly dried with cotton wool, so as to get rid of all water which favours the growth of the fungi, and finally it is sponged with a solution of bichloride of mercury in absolute alcohol (1 in 1,000). This gives rise to considerable pain for a moment, but it soon passes off. The alcohol is allowed to evaporate, and then the meatus is plugged with sterilised cotton-wool, which is not removed until the following day. It will then be found that many of the spores that had resisted the action of the germicide applied the previous day have germinated in the interval, and there is apparently as much fungus as before. It is not so dense, however, and is more easily removed by the same means. This process is repeated daily until no more fungus forms, then the eczema or other complication is treated in the usual way. After the fungus has ceased to grow I often insufflate a powder of boric acid 2 parts, bismuth salicylate 1 part, and oxide of zinc 3 parts. Such a combination completes the cure not only of the otomycosis, but also of the eczema of the meatus.

Prophylaxis consists in keeping the ear canals very clean and dry, and especially in avoiding the entrance of sea water, which, by reason of its deliquescent salts, apparently conduces more than fresh water to the growth of the fungi.—*Brit. Med. Journ.*, Dec. 22, 1900.

MISCELLANEOUS.

QUININE AND HÆMOGLOBINURIA.—An interesting account of "blackwater" following the administration of quinine is given in *The News* under the heading of Assam Missions, by Mr. and Mrs. Mason. Their son, a boy named Gordon, died of fever, and the parents state that "No doubt exists in our minds that quinine was the direct cause of death. Let those who handle it beware if its use is soon followed by a chill." That the child showed a marked idiosyn-

crasy to the action of quinine appears evident, as perusal of the following admirable description by Mrs. Mason shows:—

"I had the children in Darjiling in the spring of 1899. While there, Gordon had two chills, followed in the one case by subnormal temperature, in the other by not high fever. But each time the water he passed was so black that after the second I called the doctor, who took it for analysis. While on our way home during last May, Gordon had such an attack, and again three or four times during the summer. Then we noticed that each time it was after he had had one grain of quinine, and remembered that in Darjiling and on the way home he had had the quinine shortly before the chill. Here we noticed that just about two and a half hours elapsed after giving the one grain quinine capsuled pill until the chill came on. He had not in any case had fever just before, but showed symptoms of malaria, so we gave the quinine as a preventive. In one case the temperature ran above 106 degrees F. in less than two hours, and within six hours after was down to 96 degrees. Every time the water passed during the chill was like black blood. We corresponded with Dr. Rivenburg about it. He analysed the water and pronounced the disease "blackwater," telling us the child ought to leave the country. We gave no more quinine and Gordon had no fever from August, 1899, to June, 1900. From his birth he had been an unusually large, robust child; and during the past year, as always, strong and active. But early in June he began to have fever from time to time, finally settling down to every other day, temperature sometimes not much, again going to 105 degrees. We learned that the doctor had "euquinine" which was said to have all the good but none of the bad effects of quinine, so two doses of this were given to Gordon on different days, and we hoped much from its use, but it turned out that there was no more in hand. On June 29 he had some fever during the forenoon, not much, and temperature had gone down to normal and he was playing about feeling bright and lively. Mr. Mason was very anxious to break the fever which seemed to be getting such a hold upon him, and strongly advised by the doctor, we gave quinine in capsuled pills. In just two and a half hours he began to be chill and passed some of that terrible water. In less than two hours his temperature was 106·3 degrees, chill very hard followed by great perspiration, and temperature dropped slowly to 97 degrees. He did not get back his strength and seemed tired, but was about, playing as usual. On July 5 he had fever; on the 6th was very bright and lively; and on the 7th temperature 104 degrees; on the 8th he went to meeting as usual, but in the afternoon his temperature went up to 103 degrees; on the 9th to almost 102 degrees in the afternoon, then it was going down and he was sweating. That morning the "euquinine" came from Calcutta and on the doctor's advice we gave Gordon a dose in powder. In one hour the child was in a terrible chill, and the water he passed was simply black! His temperature rose 1·2 degrees in fifteen minutes, reaching 105·2 degrees at 3·5 in the afternoon. Then it fell and rose and fell again keeping not far from 100 degrees to the end. He could keep

nothing on his stomach after Sunday the 8th, drank a great deal during Monday and the night, but did not care for anything after early Tuesday. He evidently suffered much in the abdomen. Toward noon of Tuesday he seemed not to know or notice much, and with one slight exception showed no sign of consciousness afterward."

PEKIN INVITES PESTILENCE.—A report from Pekin, dated November 15, says: "Sanitary conditions here are becoming serious. Since the foreign occupation many Chinese have died of smallpox and other infectious diseases. Fearing that their funerals will be interfered with, they have kept most of the coffins containing their dead in their houses and courtyards. The question of removing garbage has become one of grave importance. As the natives are forbidden to deposit refuse in the streets, there is now an enormous accumulation in their dwellings and yards, which threatens a serious epidemic. In view of the large number of troops in and near the capital, the consequences of such an outbreak would be frightful. Smallpox, which is always prevalent, is much more malignant during winter, and the danger here is now alarmingly increased."—*Sanitarian*.

Letters, Communications, &c., have been received from:—

- A.—Mr. G. N. Alexis (Grenada).
 C.—Dr. D. W. Carr (Isfahan).
 D.—Dr. A. B. Dalgetty (Adampore).
 G.—Dr. R. M. Gibson (Hong Kong).
 H.—Mr. Gordon Hooper (London); Dr. W. Hossack (Calcutta).
 K.—Dr. W. E. de Korte (Cape Colony).
 N.—Dr. G. H. F. Nuttall (Cambridge).
 R.—Dr. R. Ross (Liverpool).
 S.—Dr. Malcolm Smith (Singapore); Dr. R. A. Shekleton (Newtownards); Dr. Van der Scheer (The Hague).

EXCHANGES.

Annali di Medicina Navale.
 Archiv. für Schiffs u. Tropen Hygiene.
 Archives de Medicine Navale.
 Archives Russes de Pathologie, de Medec., Clinique et de Bacteriologie.
 Australasian Medical Gazette.
 Boletin de Medicina Naval.
 Boston Medical and Surgical Journal.
 Bristol Medico-Chirurgical Journal.
 British and Colonial Druggist.
 British Journal of Dermatology.
 British Medical Journal.
 Climate.
 Clinical Journal.
 Clinical Review.
 Giornale Medico del R. Exercito.
 Hongkong Telegraph.
 Il Policlinico.
 Indian Engineering.
 Indian Medical Gazette.
 Indian Medical Record.
 Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.

Journal of the American Medical Association.
 La Grèce Médicale.
 Lancet.
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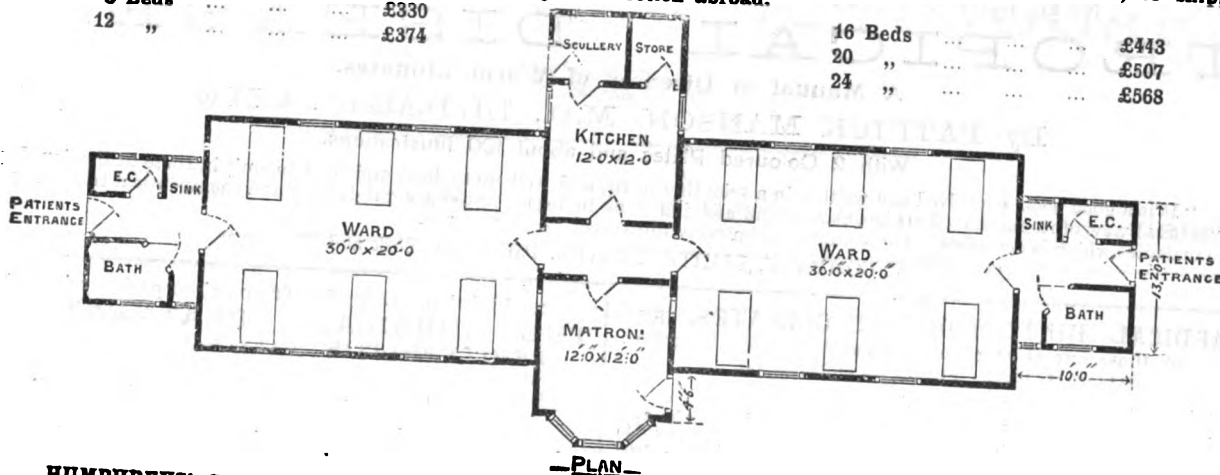


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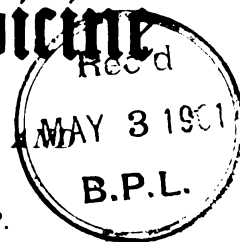
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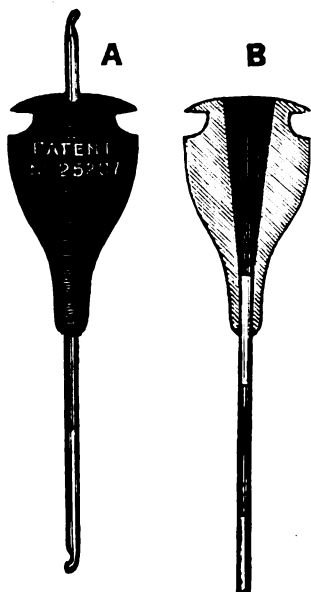
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A CASE OF YELLOW FEVER AT SALTPOND, GOLD COAST.

By S. OSBORNE BROWNE, M.B., C.M.

Assistant Colonial Surgeon.

February 27, 1901.

I THINK the following case may be of interest to readers of the JOURNAL OF TROPICAL MEDICINE, especially as the Gold Coast is being largely opened up to European enterprise at the present time.

In the Journal for July, 1899, Dr. Elliott gives an account of three cases of yellow fever in Saltpond, and it is my fortune to add one more case to the number.

H. M., mercantile clerk. Scotch. Aged 22.

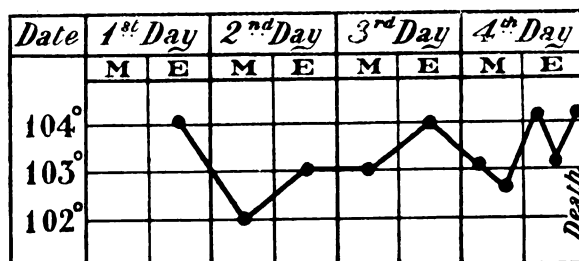
Previous History.—Came to Saltpond one year ago; never in tropics before. Strong robust constitution; nervous; sanguine temper, inclined at times to melancholia or irritability.

From what I hear he was a teetotaler at home, but like many others he took stimulants on the Coast, and it often assumed the pernicious form of beer. Had several bilious fevers, from which he rapidly recovered. For some time before his last illness he ate oranges immoderately, and was frequently unwell from dealing with rubber. His residence was in a good position on rising ground, clean, new and not very near native houses or the lagoon. His illness occurred in the height of the dry season, and mosquitoes were conspicuous by their absence, although a few exist, especially *Culex*.

History of Present Illness. 1st day.—8 p.m. Temperature 104°F. Pulse 100, strong. Tongue dirty brown in centre, red at edges. Skin dry. Very restless. Great headache. R: Calomel gr. 15; pulv. jalap. gr. 25; rhubarb, gr. 12; phenacetin, gr. 20. In tabloids.

2nd day. Morning.—No sleep during night. Vomited the medicine during night. Very restless. Skin dry. Vomited mucus with green curds. Tongue

still dirty. Temperature 102°. Pulse 90. R: Tab. quinine bisulphate, gr. 3. Seven tabloids taken, i.e., gr. 21. Acid. hydrocyanic dil. to relieve the gastric distress. Evening.—Condition much the same as in morning. R: Calomel, gr. 15. Turpentine enema. Temperature 103°F.



3rd day. Morning.—Patient lying in his pyjamas on a couch without covering in strong draught. Temperature 103°F. Pulse 110, soft, weak. No sleep last night. Tongue same. Eyes bloodshot. Gave magnes. sulph., and quinine bisulphate, gr. 21. No parasites in blood. Evening.—Copious dark green stools. Patient deaf from quinine. Temperature 104°. First black vomit consisting of clear mucus splashed with a very dark brown oily substance in small amount.

4th day. Morning.—Copious vomit with increasing amount of dark brown oily splashes, and also coffee-grounds like material. Vomiting without much effort. Copious dark green stools with a little substance like the splashes in the vomit. No sleep during night. Extreme restlessness and some anxiety. Complaints of being "sore all over," but no headache and only an uneasy sensation in the epigastrium. Temperature 103°. Pulse 100, small, thready. Skin dry. Ideas wander at times. Gave him 15 gr. quinine bihydrochlorate into gluteal muscle; also 40 gr. per rectum. Champagne at intervals between the vomiting with 1 gr. cocaine and $\frac{1}{2}$ gr. morphine. Gave $\frac{1}{10}$ gr. pilocarpine hypodermically. Fed him all day on meat and milk enules and enemata of egg and cham-

pagne. Temperature kept hovering between 102.6 and 104°F. *Evening*.—About 2 p.m. he passed urine copiously, but not again. Extreme restlessness. About 7 p.m. he got very yellow; copious black vomit. Mind wandering; moaning and tossing about. Features pinched. Liver much enlarged. Became delirious, and had to inject morphine to keep him in bed. Put hot pack round waist and wrapped him in blankets. Still no urine. Expulsive efforts of stomach violent, but vomit falling back time after time with gurgling noise. Extremities growing cold. Coma. Face livid, turgid, and profuse sweating occurred. Bleeding occurred from the nose and gums just before death, which happened at 11 p.m.

Post-mortem.—Almost immediate blotching of the body with livid cyanosed blotches, especially on back, which wore off in places, leaving the body a general dirty yellow. No smell was detected from the body. The blood was dark and cyanosed.

I regret that no specimen of urine was obtainable.

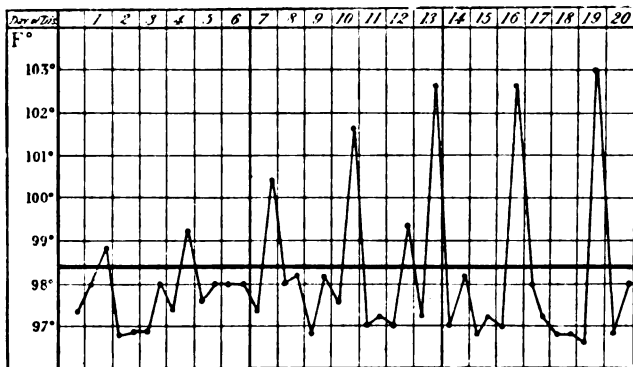
A CASE OF QUARTAN SHOWING CYCLIC VARIATION OF PARASITES.

By G. DOUGLAS GRAY, M.D.

London School of Tropical Medicine.

Communicated by Dr. C. W. Daniels, Medical Superintendent, London School of Tropical Medicine.

CARUM, Indian, adult male, native of Madras. Left Colombo three weeks before admission to hospital. Said he had no fever on the voyage. He was admitted to hospital for ulcers of the legs, but had on the fourth day after admission an evening temperature of 99.2°. Three days later—the seventh day after admission—it rose to 100.4°. On the tenth day it was 101.6° and then three successive cycles at regular quartan intervals registered from 103° to slightly over 104° F. Quinine was administered after this and there were no further rises of temperature.



The chart was therefore a typical one of a developing case of quartan fever, at first gradually increasing in severity and then practically maintaining a certain degree of intensity till quinine was given.

Each rise of temperature was for a period of six to eight hours, and the patient passed through the classic stages of an attack of ague. Beyond the headache, and on one occasion, slight delirium, there was

nothing beyond the ordinary febrile phenomena of importance.

Blood examinations were commenced just after the third cycle, so that three entire cycles were observed before quinine was given.

The main observations were made with a view of showing the rate of increase, or otherwise, of the parasites. For this purpose the number of parasites and leucocytes in a number of fields were examined in fresh blood films to determine the ratio of parasites to leucocytes.

A separate estimation of the number of leucocytes in a cubic millimetre of blood was made each day. From the combined results of these observations the number of parasites in a cubic millimetre of blood could be approximately determined.

During the first observed, but really fourth cycle, there was an average of 500 parasites; during the second observed cycle, an average of 446 per c.mm.; during the third an average of 627; and the fourth observed cycle showed an average of 302 parasites per c.mm. Quinine was then given and continued, though the parasites did not immediately disappear, and three days later 210 per c.mm. were still present; on the following day 35 per c.mm. were found, and later on only so occasionally that the number could not be estimated.

There was no leucocytosis, the highest count only revealing 7,710 per c.mm.

These results are of interest. They show that though the number of spores formed by each parasite is six or more, if uninterrupted multiplication existed and the parasites in the first observed cycle were 500, in the second they should have been at least 3,000, in the third 18,000, and at the commencement of the fourth cycle 108,000.

However large allowance may be made for the inaccuracies both of the method and observations, it is certain that no such multiplication occurred. It therefore follows that some natural check existed which, when the number of the parasites had reached a certain level, prevented any such multiplication, and that during the period in which the cycles were observed this check was sufficient to neutralise the natural rate of increase and maintain a constant number.

These observations have an important bearing both on natural cure and immunity, and on the protracted periods during which the parasites appear to be latent.

As regards "natural cure," it is obvious that any increase in the "check" to the multiplication of parasites would result in a diminution of the number of parasites in each cycle until they were too few to cause any symptoms, and would ultimately lead to the extinction of the parasites or to their numbers being too small to be found in ordinary examination.

As regards immunity, it also follows that if the conditions are such that multiplication by sporulation is impossible, an infection will lead to no great formation of sporocytes, or their perpetuation. As regards "periods of latency" (a better term than "latent periods"), all that is required is that the check to indefinite multiplication by sporulation of the parasites should occur when the number of parasites is so

small that they are not sufficient to cause symptoms, or to be found by ordinary methods of examination. One parasite to the cm. would probably escape detection, even if frequent examinations were made; and yet with that number there would be some millions in the total blood.

This, Dr. Daniels informs me, is Major Ross's theory of the periods of latency, and avoids the necessity of assuming the existence of an unobserved special or latent form of the parasite.

That parasites can exist in the blood in small numbers, remain so, and yet continue to breed, was shown in this case, as from time to time an occasional parasite was found belonging to a cycle twenty-four hours in advance of the one described, but only on one occasion did this generation make its presence apparent by causing a rise of temperature to 99.4° F.

was beri-beri hydrops. The first of the blind children, Tsing Lin Yan, admitted on October 22, 1899, to the Nethersole Hospital, showed severe cardiac symptoms, œdema of the legs and inability to walk. Under the influence of rest, and iron and quinine, her heart became regular, the œdema disappeared, and after a few days she was able to walk slowly. The others were in a similar condition when admitted to the hospital. No albumen was found in the urine of any of these cases. The noticeable feature in these cases was the great predominance of cardiac symptoms. Altogether eight children from this Institution suffering from beri-beri were treated in Nethersole Hospital, and on December 8 they were taken to Macao in good health.

EPIDEMIC OF BERI-BERI IN BERLIN FOUNDLING HOUSE, HONG KONG.

Later in the year (1899), November 25, a case was sent to the Nethersole Hospital from the Berlin Foundling House, the symptoms pointing to beri-beri. The Berlin Foundling House is situated at Breezy Point in the western district of Hong Kong. The house is well built and drainage good, but the younger children, those who suffered from the disease, dwell in the lower parts of the house. The inmates are girls who in infancy had been abandoned by their parents, rescued into and brought up in this institution. At the time of the outbreak there were sixty-nine infants in the lower part of the house and twenty-seven older girls in another part. The former only were attacked, and three of them were sent to the Nethersole Hospital. The majority of the younger children whom I examined at the Foundling House showed slight œdema over the tibia and forehead, exaggeration of the knee-jerk, slight dilatation of the heart to the right of the sternum, and the pulse irregular in frequency and of low tension and small volume. Leung Wa, a child of 4 years, was the first case admitted, with a history of having suffered from eye disease at the time of the onset of beri-beri symptoms. In this case the knee-jerk was absent and no albumen was found in the urine. The second case, Mak Kin, aged 5 years, was bed companion of Leung Wa, and in her case one knee-jerk was absent. The third case, Chan Yan Lin, aged 2 years, slept in the same room as the two girls already mentioned. She showed knee-jerk diminished but not quite absent. These could only walk with great difficulty. On January 23, 1900, I again examined these three cases and found that in the two first mentioned the patellar reflex was slow and obtained with great difficulty, and that their movements were less free than normal. There had been frequent intercourse with the German Blind School, and probably beri-beri poison was carried from one to the other. The type of the disease was beri-beri hydrops, and at first seemed to be of a less severe character than in the Blind School. There appeared to me to be overcrowding. The diet was liberal, and consisted of rice with vegetables, eggs or meat, rice congee and milk; though it was afterwards discovered

BERI-BERI IN HONG KONG, WITH SPECIAL REFERENCE TO THE RECORDS OF THE ALICE MEMORIAL AND NETHERSOLE HOSPITALS, AND WITH NOTES ON TWO YEARS' EXPERIENCE OF THE DISEASE.¹

By B. MacLEAN GIBSON, M.D., C.M., Edin.

(Continued from p. 99.)

EPIDEMIC OF BERI-BERI--GERMAN BLIND SCHOOL.

THE German Blind School for Chinese children is situated near West Point, Hong Kong, and from its situation one would expect it to be malarial. It lies low, and its site was cut out from the side of the hill, and no proper through current of air is possible, nor are the rooms freely exposed to sunlight. The back rooms especially are very dark and unhealthy. The children attending the school are girls from 2 to 20 years of age, most of whom have lost their sight through purulent ophthalmia. They live and board with the matron. The first case of beri-beri noticed was in September, at which time there were eleven children in school: of these eight took ill, but none died. Earlier in the year, however, two children had died with signs of œdema and endocarditis, one of whom was ill only a few hours. The epidemic probably began with those cases. The first case (in September) was a native of Canton, and had resided in the school for a year. The matron noticed that two of the cases had fever, and all had weakness of the legs and swelling. Medical examination revealed œdema of legs and face, and irregular dilated heart in all the cases. After becoming affected with beri-beri, the children were kept apart from the others. The usual diet was rice, pork or salt fish and vegetables. The type of disease

¹ Owing to want of space, the Editors regret that they are unable to give the detailed account of nine cases of beri-beri recorded by Dr. Gibson. The patients referred to were all supplied with a liberal diet, including beans and pork. Brandy, quinine and iron, digitalis and strychnia were the chief drugs employed. The article is accompanied by several photographs showing the different types of beri-beri with which we are familiar.

that the Chinese cook was in the habit of buying the most inferior rice he could obtain—of a poorer quality than the ordinary coolie uses himself. On December 7 all the children were removed from Hong Kong to Macao, including the three cases from the hospital. From the medical attendant at Macao I received information of the sudden illnesses and deaths of three of the children. On the day after arrival in Macao, one of the children had vomiting, diarrhoea and headache, followed by collapse and death in thirty-six hours. The second had similar symptoms and died after fifteen hours' illness. Two weeks later a third case occurred. The first symptom was retention of urine, followed by vomiting and collapse, and legs from knees downwards were quite dark-coloured; death occurred seventeen hours after the onset of the symptoms. Vomiting and diarrhoea have always been recognised as very dangerous symptoms in beri-beri, especially if the heart is dilated. My opinion is that these deaths were due to beri-beri, though earlier symptoms may not have been apparent.

I will now seek to group the facts contained in these notes of cases under the following headings, discussing each as may seem necessary: (1) symptoms and signs in early cases, (2) symptoms and signs in more advanced cases, (3) morbid anatomy, (4) etiology, (a) specific cause, (b) predisposing causes, (5) diagnosis, (6) prognosis, (7) treatment.

(1) *Symptoms and Signs in Early Cases.*—One of the earliest symptoms noticed is fever. A Tim (No. 1) suffered for a week from fever before marked beri-beri symptoms appeared. Li Yan Lin (No. 2 case) and Wang Si Kin, No. 8,²⁷ had early high fever, the former for four days, the latter for three days. The temperature charts of these two patients illustrate well the character of the early fever in beri-beri; the fever in both reached 104° F. on the same day as the first beri-beri symptoms were noticed. After the first few days the temperature is low but still irregular. On questioning patients with subacute or chronic beri-beri as to the presence of fever early in their illness, one Chan Kwai said he felt hot and cold for a few hours. Another, Chaw Chek, case No. 6, had fever for one day, a third, Lo Mo Tsun, No. 3, had fever for one night. Some answered that they had had no fever at the beginning of the disease, but probably the fever had been of such short duration that it either had not been associated with their subsequent illness or had been forgotten. Early high fever is a very constant symptom, but its absence does not invalidate a diagnosis of beri-beri. Another very early symptom is numbness, expressed by the Chinese word "pi," which is often present with the fever or comes on soon after; as a rule this numbness is felt over the dorsa of the feet, rising soon over the tibia and thighs. In some, however, the hands and arms and the whole body become numbed at an early stage. Associated with numbness are weakness and loss of power of the legs. The pulse in early atrophic cases, though irregular in frequency and rapid, is yet of good volume and tension; but in early dropsical cases the pulse is of low volume and tension. The patellar reflexes are absent or diminished. When even the case was seen early in the disease patellar reflexes had occasionally disappeared. "Sam tin" or "pap pap tin" as the

Chinese call palpitation of the heart, may be present early in the disease and is very alarming. This disturbance of the heart's action was found in many of the Blind School and Foundling House children. Oedema of the legs is a constant early symptom, which may be very slight in "dry beri-beri," but in dropsical cases may be considerable a short time after the onset of beri-beri symptoms. Among the children of the above schools, marked oedema was a striking early feature. Other early symptoms, but of lesser diagnostic importance, are headache, pain in epigastric region and constipation.

(2) *Symptoms and Signs in more Advanced Cases of Beri-Beri must be divided into those seen in (a) Atrophic cases; (b) Dropsical cases; (c) Mixed types.*

(a) In atrophic cases which have passed the early stage one finds that the temperature is practically normal and that numbness is felt chiefly in the legs and hands, but also over the abdomen. The legs are weak, and patients may be unable to walk or raise themselves from the recumbent position without help. The muscles of the calves of legs and thighs are atrophied, and on pressing the calves acute pain is felt. Should the patient be able to walk he will probably do so with a peculiar "steppage" gait, as though he had to step over obstacles on the floor. Case 4 after being in hospital for a time showed this gait. Palpitation of the heart is now a more prominent symptom than in the earliest stage of atrophic cases, while the pulse is very characteristic—of low tension, small volume, irregular in frequency and rapid, 100 to 120 per minute. Sometimes it is not possible to count the pulse, as the tension is so low and the volume so small. The oedema is very slight in this type of beri-beri, and is noted over the crest of the tibia and on the forehead. The patellar reflexes are quite absent; as the patient improves, however, the reflexes gradually return. On examination of the heart diffuse pulsation over the cardiac area is seen, while the apex beat seems displaced downwards. The heart sounds are free from murmurs, but faint; the second sound at the pulmonary area is often reduplicated. As the heart becomes excited under examination the cardiac sounds constantly vary in intensity. Digestion is good, and the patient is remarkably well considering the severity of the symptoms. These are the usual symptoms of a typical atrophic beri-beri case in Hong Kong, when the disease has asserted itself for weeks or months. At times, however, I have seen more severe symptoms, e.g., case 7 had hiccough for a day, his voice became weak, and he complained of pain over the larynx. Another case which I saw in the Tung Wah Hospital also suffered from an affection of the larynx. A third patient could not button his coat so atrophied were the muscles of his hands and arms.

(b) On examination of a well-marked dropsical beri-beri case, one finds the cardiac symptoms predominating, while numbness, weakness, and loss of power of the legs are also present. The patellar reflexes are absent. The pulse can only be felt with difficulty because of its low tension and small volume. The heart is dilated to the right of the sternum, the apex beat being displaced downwards and outwards. No

murmurs are heard. The most prominent symptom is the severe swelling, the patient having the appearance of a serious case of Bright's disease. In a male there was œdema over the legs, thighs, scrotum, penis, abdominal wall, and chest as high as the clavicles. The patient seemed in a critical condition, and when the œdema rises thus far the Chinese become alarmed. I remember seeing an eye patient develop dropsical beri-beri symptoms so rapidly that he died before I realised that he was seriously ill. This case occurred very soon after my arrival in Hong Kong, and were I to meet another such case I should try venesection with the hope of saving life. On examination of the urine of dropsical cases no albumen was present.

(c) In the mixed type there is a combination of the symptoms of the two previous types, the œdema of the legs being greater than in atrophic cases, but not so marked as in dropsical cases. The puerperal case met with did not seem to differ in any way from types already referred to. Beri-beri among children, as far as I have seen it in Hong Kong, tends to assume the dropsical form, but recovery is more rapid than among adults. I have seen no mental disturbances in any beri-beri case.

(3) *Morbid Anatomy*.—As the Chinese are opposed to any interference with their dead, *post mortem* are rarely made in our hospitals, and I cannot speak of the morbid anatomy of beri-beri. Pekelharing and Winkler (Cantlie's translation) have proved that the disease is really a multiple neuritis chiefly confined to the peripheral nerves; and as one approaches the central nervous system the pathological evidence of nerve change diminishes.²⁸

(4) *Etiology*. (a) *Specific Cause*.—Various theories have been held as to the cause of beri-beri. The most important of these are (1) anæmic theory; (2) rice theory; (3) parasite in intestine theory; (4) specific bacterium either (a) in blood itself or (b) in the soil or dwelling houses. (1) The theory that beri-beri is of the nature of an anæmia was disproved by Dr. W. Taylor, who made definite observations on the blood of beri-beri patients. He showed that they are not essentially anæmic and, in fact, are rarely anæmic.²⁹ Clinical evidence in Hong Kong also proves that very few beri-beri patients are anæmic. (2) The epidemic in Dublin Asylum, where the patients were fed on a diet in which "rice was little used, practically only as a medical extra,"³⁰ goes far to discredit the theory that the specific cause of beri-beri is to be found in rice. Rice forms a large part of the diet of the Chinese in Hong Kong, but is quite as much used in the interior of China where beri-beri is comparatively rare. Though rice as a staple food is deficient in nitrogenous elements and fats, the Chinese in Hong Kong endeavour to supplement this diet with pork and beef. (3) The theory of intestinal origin of beri-beri has been quite abandoned. (4) There is little doubt that beri-beri is due to a specific germ, the question at issue being now whether, according to Pekelharing and Winkler, the bacterium can live in the blood of the patient,³¹ or, according to Dr. Manson, lives only in the soil or dwelling-houses and there produces poison which is inhaled by those residing in the infected areas.³² If one may form an opinion based on clinical

evidence, I would say that a specific germ enters the blood of the patient and there produces toxins analogous in some way to the Klebs-Loeffer bacillus of diphtheria. The early high fever in beri-beri seems to me to point to a definite stage in the life of a specific bacterium in the blood. The incubation period, I would say, is as short as three weeks, but may be much longer.

(b) *Predisposing Causes*.—*Race*: In Hong Kong there seems to be no racial immunity from beri-beri, as Europeans, Japanese, Indians and Chinese are attacked. *Age*: As has been already shown, the average age of beri-beri patients treated in connection with the Alice Memorial Hospital was 30·87 years, but I venture to say there is no age immunity. *Sex*: Among adults the male sex is most readily attacked, the number of female cases being comparatively small. Parturient women, whether from weakness or through presenting open wounds, are specially liable to be affected. *Occupation*: Coolies, carpenters, cooks, barbers, sailors, and water-police in Hong Kong suffer most from this disease. *Previous Disease*: A former attack of beri-beri is known to predispose to a second, third, or fourth attack. Often beri-beri seems to follow on malarial fever, dysentery, syphilis, ulcers of the foot or leg, eye diseases, injuries and surgical wounds. I have seen several cases in which the patients developed beri-beri subsequent to eye disease. *Over-crowding and the Habits of the Chinese*.—*Insanitary Dwellings*: Owing to the heavy rents the Chinese herd together and over-crowding is common. The general habits of the Chinese predispose to this as well as to many other diseases. When wet weather comes they will scarcely move from their houses, and thus the atmosphere of the over-crowded dwelling-places soon becomes vitiated. Their houses are far from clean, and any germ requiring heat, dust and filth for its development, finds these conditions in Hong Kong houses. Even the structure of the houses is insanitary, and in this connection it is interesting to read the remarks of the Medical Officer of Health for Hong Kong in his report for 1897: "In Hong Kong almost all dwellings are about 13 ft. wide (exclusive of thickness of party walls) while they may extend in depth for some 30 to 50 ft., and consist of one long narrow room on each storey, lit only by one or two small windows, except upon the ground-floor, where the whole front is more or less open during the day-time. At the back of this room is a cook-house with smoke hole in the ceiling, while the room itself is subdivided, by partitions of match-boarding 8 ft. high, into a number of cubicles varying in size from 6 ft. by 7 ft. by 10 ft., each of which constitutes the home of two, three, four or more persons. It can readily be imagined that the amount of light which penetrates the interior of these cubicles is infinitesimal, and it is almost impossible for any one who has not ventured into these dwellings to realise the amount of filth and rubbish that will accumulate in them even in a few weeks."³³ The fact, also, that the foundations of most houses in Hong Kong have to be cut out of the hill-side, tends to make them damp and unhealthy. *Climate*: As mentioned in the earlier part, the damp, hot season, predisposes to the prevalence of the disease. *Food*: Food deficient in

nitrogen and fat is undoubtedly a predisposing cause, and with change of diet much improvement is soon observed. The fact that beri-beri is non-endemic in the colony is another predisposing cause.

Diagnosis.—This resolves itself into the recognition of the nervous and cardiac symptoms peculiar to beri-beri. In atrophic cases, numbness, loss of power of the limbs, irregular feeble pulse, slight œdema over the front of the tibia, and irregular heart in a patient residing in an endemic region, are the symptoms to be looked for. In dropsical cases, severe œdema, associated with numbness, weakness of the legs, absence of albumen in the urine, and pulse irregular, of small volume and low tension, in similar circumstances, warrant a diagnosis of beri-beri. In mixed cases a combination of these symptoms will be noted.

Prognosis.—It is difficult to give a definite prognosis, but generally speaking an atrophic case will get well in two or three months, while a dropsical case may die at any time, death often being sudden. The earlier the patient is removed from the endemic area the more favourable is the prognosis.

Treatment.—The first step is to remove the patient from the place where he contracted the disease, and if possible, place him in a dry, airy house. His diet should then be changed to beans and fat pork—beans possessing a larger percentage of nitrogen and fat than rice. The following prescriptions have been used in our hospitals in treating beri-beri patients:—

R	Tinct. digitalis .. ..	..	..	..	℥ii.
	Tinct. ferri perchloridi ..	..	..	..	℥ii.
	Acid phos. dil. .. ..	..	..	..	℥iii.
	Infusi calumbæ ad .. ..	..	..	..	℥vi.
M.	Sig.: A tablespoonful three times a day.				
R	Liq. Arsenicalis .. ..	..	..	..	℥ss.
	Liq. Strychninæ ana ..	..	..	..	℥ss.
	Liq. ferri perchloridi ..	..	..	..	℥i.
	Glycerini .. ..	..	..	..	℥vi.
	Infusi calumbæ ad .. ..	..	..	..	℥vi.
M.	Sig.: 3ss. t. i. d.				
R	Quin. sulph. .. ..	..	..	..	grs. 60
	Ferri sulph. .. ..	..	..	..	grs. 36
	Magnes. sulph. .. ..	..	..	..	℥iv.
	Acid sulph. dil. .. ..	..	..	..	℥i.
	Sp. Chloroform .. ..	..	..	..	℥ii.
	Aq. Menth. Pip. ad ..	..	..	..	℥vi.
M.	Sig.: A tablespoonful three times a day.				
R	Lin. terebinth.				
	Sig.: To be rubbed into the muscles.				

In dropsical cases one tablespoonful of brandy administered every two hours has been found very effective. Should dyspnœa supervene venesection should be tried.

NOTES AND REFERENCES.

²⁷ Case seen 'in Tung Wah Hospital; notes made by resident house-surgeon.

²⁸ "Beri-beri," by Pekelharing and Winkler, p. 99.

²⁹ "Studies in Japanese Kah Ké or Beri-beri," by Wallace Taylor, M.D.

³⁰ *British Medical Journal*, September 24, 1898, p. 876.

³¹ "Beri-beri," by Pekelharing and Winkler, p. 140.

³² "Tropical Diseases," by Patrick Manson, M.D., p. 238.

³³ Report of Medical Officer of Health for 1897, *British Medical Journal*, July 23, 1898.

NOTE ON THE MAL-TREATMENT OF MALARIAL FEVER, AND ITS CONSEQUENCES.—B. Mohun Sircar, L.M.S., Calcutta, makes two important statements—(1) That malarial fever *first* made its appearance in Jessore some three-quarters of a century ago, and that within our recollection it next appeared in the districts of Burdwan, Hughly, Nuddea, and the twenty-four Pargunnas in the latter end of the fifties; whilst later on it spread to Ringpore, Rajshahi, Dinajur, and other districts. This statement would lead one to infer that these parts of Bengal had previously been free of malarial fevers, and that the inroad was an innovation. It would be interesting to know if this statement can be substantiated by any other observer. If true, it is a remarkable piece of medical history, and places parts of Bengal on a similar footing with Mauritius, as examples of recently imported paludism. (2) The second statement, that the poorer people of Bengal suffer in consequence of using patent medicines, can readily be believed. The medicines offered them as "fever" medicines, by patent medicine vendors, contain almost invariably quinine, iron and Epsom salts in one mixture; and as Mr. B. M. Sircar points out, the iron is taken with the quinine when the temperature is high, and the Epsom salts with both when purgation is no longer desirable. Whether the enlargement of the spleen so frequently seen in the riparian districts is partly consequent upon patent medicine taking, as suggested by Mr. Sircar, it is difficult to decide, but that harm is done there can be no doubt.—*Ind. Med. Rec.*, January 23, 1901.

DESTROYING RATS BY CARBONIC ACID GAS.—Dr. P. Apery, of Constantinople, calls attention to a practical means of destroying the rats on board ships, which was incidentally discovered in the following manner:—A case of plague was confirmed on board the steamship *Polis Mytilini* while in the harbour of Trieste in November, 1899. While the hold was being disinfected no dead rats were found at first, but on removing some barrels of molasses which had become fermented, a large number of dead rats were discovered undoubtedly suffocated by the generation of carbonic acid. Apery suggests that this discovery of accidental suffocation of rats by means of carbonic acid should be utilised by ships on the high seas in the following manner:—The rats should be inveigled into the hold by means of tempting baits, and then killed by suffocation with newly made carbonic acid. The latter could be easily generated from any carbonate, for instance, marble, by the addition of acids, or by means of an apparatus containing solid or liquid carbonic acid. This method is advantageous for the reasons that it arrests decomposition, has no odour, it sinks on account of its weight, and permeates every nook and corner. Its presence can be detected by lowering a burning light, and it can be dispersed by the air pump or ventilation.—*Le Progrès Medical*, January 13, 1901.

PROFESSOR W. J. SIMPSON, at present in South Africa, and engaged on the Enteric inquiry, has been selected by the Colonial Government for Plague duty in Cape Town.

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THE

Journal of Tropical Medicine

APRIL 1, 1901.

THE RELATION OF YAWS TO SYPHILIS.

At the Polyclinic, London, on March 27, Dr. Morgan Finucane, Assistant Medical Officer, Fiji, read a paper on "Fijian Yaws," before the Committee of Investigation on Yaws. Dr. Finucane contends that the disease in Fiji differs in several respects from the types met with in the West Indies, West Africa, &c. Yaws is endemic in Fiji and scarcely any Fijian escapes the disease. The native belief appears to be that unless a child contracts yaws it will grow up weakly and unfit to withstand other diseases, and the Fijian mother does her utmost to induce the disease in her offspring before it has attained the age of two. The probable source of infection is by means of flies which have fed on yaws, or from actual contact with a yaws sore. A true primary sore has never been seen, but it may be represented by what is termed the "mother-yaw."

That the mother-yaw is the primary seat of the inoculation has not been determined, as when the patient is seen to be suffering from a mother-yaw the skin is already covered with an eruption. Dr. Finucane recognises a short prodromal stage, possibly of three or four weeks' duration, followed by clinical characters which resemble and are apportioned by several observers, into three stages, resembling the primary, secondary and tertiary stages of syphilis. Amongst the signs and symptoms are cutaneous sores, attaining a mulberry appearance; condylomatous patches invading the mouth, fauces, palate and anal regions; chronic general adenitis, marasmus, chronic diarrhoea and dysentery, bone affections, and pigmented scars.

Dr. Finucane is firmly of the belief that yaws is a form, or, as Mr. Jonathan Hutchinson puts it, the "parent form" of syphilis. His contentions are partly based on historical evidence, verified by clinical and therapeutic observations. So far as is known, no medical man in Fiji has ever seen a case of hard chancre in a Fijian. The author of the paper holds that the syphilitic poison was introduced into Fiji in the latter part of the 18th or beginning of the 19th century; that the disease took an epidemic form, but after a time settled down to the modified form it is now met with; that the Fijian is protected by being already syphilised by yaws. Mr. Jonathan Hutchinson, F.R.S., joined in the discussion, and brought considerable evidence to bear in favour of yaws being the parent form of syphilis. Dr. Patrick Manson, C.M.G., F.R.S., Dr. Radcliffe Croker, Dr. Colcott Fox, and Mr. Cantlie also took part in the discussion; their speeches showing that they were inclined to dissociate the two diseases, yaws and syphilis. From a scientific, as well as from a practical point of view, it would be well were this disease made the subject of a thorough inquiry. Clinical signs and symptoms we have had in plenty, but something further is wanted, so that this much-debated subject may be settled one way or the other.

We propose publishing the full text of Dr. Finucane's paper and the discussion it created in our next issue.

SEAMEN'S HOSPITAL SOCIETY.

EIGHTIETH ANNUAL REPORT.

THE welfare of the Seamen's Hospital Society is so intimately associated with the success of the London School of Tropical Medicine that its annual report comes to be a matter of keen interest to all students of tropical medicine—in other words, to all tropical practitioners directly, and indirectly to every tropical resident.

Well nigh every British colony benefits directly by the work of the Seamen's Hospital Society, and the School of Tropical Medicine which the Society inaugurated. Scarcely a ship reaches the shores of our most distant colonies the crews of which do not owe something to the beneficent work of the Society; nor in any part of the wide British dominions is there a medical man who is not benefited by the work of the Hospital and School.

We cannot imagine any institution with higher claims on the people of the Empire, whatever their position, than that of the Seamen's Hospital Society. It is a Society the outcome of our maritime commerce, and a necessity from our being "the over-lords of the sea."

The Society's claims for support are on no parochial basis; for wherever the flag flies its work extends and its influence is felt. Let us hope, therefore, that its necessities may be met and its usefulness continued in a manner worthy of the imperial needs to which it is devoted. With this wide and general interest it is well, however, to see that its claims are not lost by virtue of its very extent. A hospital with local interest is apt to more directly appeal to the individual, whereas an institution which it is everyone's business to support frequently suffers from the very universality of its claims. We would suggest that every medical man in our colonies, every harbour master of our colonial ports, nay, every Governor in our colonial possessions, should make it his personal interest to do something in the way of obtaining funds and support for this national institution—an institution in which every one in this Empire is in some way interested, and to which many are directly and deeply indebted.

The number of sick and injured seamen treated at the various establishments under the immediate direction of the Seamen's Hospital Society amounted during the year 1900 to 25,592, of whom 2,400 were in-patients. The ordinary income was £12,421, and the legacies amounted to £6,172. The ordinary expenditure was £18,915, and the extraordinary for building improvements, &c., £354. Paltry sums these appear when the extent of the work and the character of the institution, of which they represent the income, are considered. Let us not forget that our navy exists and our armies fight for the protection of our commerce; but if our purses are open to these forces only, what will it avail us if the men engaged in commerce, for whom they are called into being, are not cared for as they should be; and the diseases which decimate many of our colonies and our sailors are not closely studied and fought, so that they may be ameliorated?

POLYCLINIC.

THE POST-GRADUATE COLLEGE.
ANNUAL DINNER.

THE advance of the Polyclinic to a place of high esteem amongst medical men continues with gratifying success. The second report of the institution is before us, and the appreciation of the work done may be gathered from the fact that during 1900 no fewer than 10,391 attendances of qualified medical men were registered. The scheme of the work consists of daily clinical consultations, of clinical lectures, of practical classes, laboratory classes, and several extramural classes. Several general and special hospitals have opened their doors and teaching to the post-graduates attending the Polyclinic, and it may be fairly claimed that a post-graduate institution worthy of the country is in a fair way to success. We hold that the attendance fee is ridiculously small. For one guinea a year the medical man finds in London practically an educational club; a daily centre of instruction and information, with library, reading and club rooms attached. The expenses of a new institution are necessarily

heavy and the absurdly small fee charged cannot be expected to cover the working expenses. The authorities of the Polyclinic believe they have a just claim on the public. Many thousands of patients are seen during the year, and the clinical work is so arranged that the patient has the benefit of not only the consultant in charge, but also of the many experienced medical men who attend the consultations. It is plain, therefore, that the poor directly benefit by the system inaugurated by the Polyclinic; and the better classes benefit perhaps even more directly still, from the fact that the medical men attending them are afforded an opportunity of acquiring the most modern knowledge of their profession and keeping abreast of the times.

The Annual Dinner is on May 22, the Right Honourable Arthur J. Balfour, M.P., in the Chair. The Polyclinic authorities have every reason to expect liberal support, not only from the medical men who have already come forward as *bénéficiaires*, but by the public and every British practitioner at home and abroad.

RESEARCHES ON THE PROTEOSOMA IN BIRDS IN GERMANY.

By Dr. REINHOLD RUGE.

Naval Staff-Surgeon.

TRANSLATED BY P. FALCKE.

The word, "Sichelkeime," used by Dr. Ruge and here translated "crescent bodies," refers merely to a sickle shape assumed by Ross's black threads, and not to the true crescent bodies met with in human malarial blood.

DURING the investigations on the development of malaria parasites conducted by R. Koch, Professor Frosch confirmed the fact that proteosoma, which hitherto had only been found in birds in the tropics and sub-tropics, also existed in Germany. He discovered the parasite in sparrows in the vicinity of Berlin. The transmission to canaries was, however, not accomplished, owing to the infection of the sparrows being too weak.

In October, 1899, however, I found a sparrow which was more strongly infected—there being five parasites in one preparation—and with this bird Prof. Frosch succeeded in inoculating three canaries. In order to discover if the biological condition of the Italian proteosoma with which R. Koch had experimented differed in any way from the German proteosoma, I made experiments with the latter parasites, and the following are the results of my researches.

(1) Periodical Occurrence.

Table I. gives a synopsis as to the periodical occurrence of the German proteosoma. On examining this table it will be at once observed that there is a certain similarity between the same and the malaria chart for Wilhelmshaven given by Wenzel.¹

Month	Percentage of Sparrows found to be infected	Strength of Infection
October, 1899 ..	20 %	Usually 1-5 parasites in the preparation. Once 5-10 parasites in the preparation. Twice 10-15 parasites in the preparation.
November „ ..	16 %	1-5 parasites in the preparation.
December „ ..	0 %	—
January, 1900 ..	0 %	—
February „ ..	8 %	1-5 parasites in the preparation.
March „ ..	No sparrows to be obtained	—
April „ ..	27 %	1-5 parasites in the preparation.
May „ ..	16 %	1-5 parasites in the preparation.
June „ ..	5 %	1-5 parasites in the preparation.
July „ ..	No investigations	—
August „ ..	No investigations	—
September „ ..	30 %	1-5 parasites in the infection. Once 22 parasites in the infection.

II. Morphology and Biology.

(a) *Morphology*.—In this respect, a distinct difference is only observable in two points: the vermicule formed in the stomach of the mosquito (*Culex pipiens*, van der Wulf) resembled the vermicules of *halteridium* far more closely than they do those of the Italian proteosoma, and the crescent forms were also much smaller than those of the Italian proteosoma.

(b) *Biology*.—First of all, the development of the German proteosoma in *Culex pipiens* was obtained at a high temperature (24-30° C).

The development was exactly as described by R. Koch. It is worthy of remark that Ross's germs (black spores) were found fairly often under certain conditions. This was always the case when mosquitoes had fed on sparrows which were suffering from a natural infection with proteosoma. If, however, the mosquitoes fed on canaries artificially infected, the black spores were very rarely observed; again, when the mosquitoes fed on canaries artificially infected by means of mosquito bites, the black spores were also rarely observed.

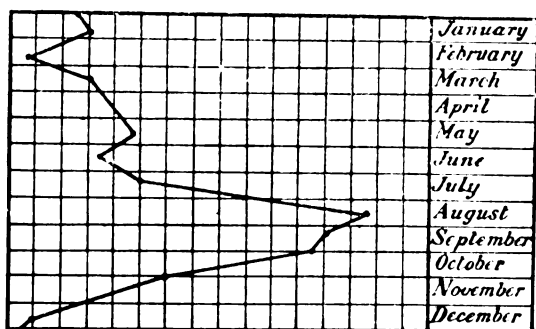
As I furthermore found brown crescentic bodies in the cysts in the walls of the stomach and forms which are intermediate between these brown crescentic bodies and the black spores, I believe I can confirm that which Ross previously conjectured, namely, that the black spores originated from the crescents.

I could not, however, prove whether these represented an enduring or a degenerate form, for at ordinary temperature in hanging drops they remained un-

¹ Wenzel, "Marsh-fevers," p. 9, Table I.

changed for several months, whereas in an incubator they were transformed in fourteen days into ovi-form bodies. Experimental feedings with the larvæ of mosquitoes were futile.

The crescents likewise developed at high temperatures, and showed lively mobility which was most apparent in the serum of canaries. In order to observe the transition of the exogenous form of the proteosoma to the endogenous form, fresh prepared salivary glands (containing numerous blasts) in a solution of canary-blood were mixed with serum of canaries. If at 41° C. an examination was made of the contents of the incubator the blasts could be quickly dispersed from the salivary glands by the lightest pressure on the cover-glass. They wriggled about actively between the red blood corpuscles, and burrowed about them, but neither penetrated the same nor clung to their surface. The blasts assumed now the form of a Greek ρ , now that of the Greek



Course of Malaria in Wilhelmshaven.

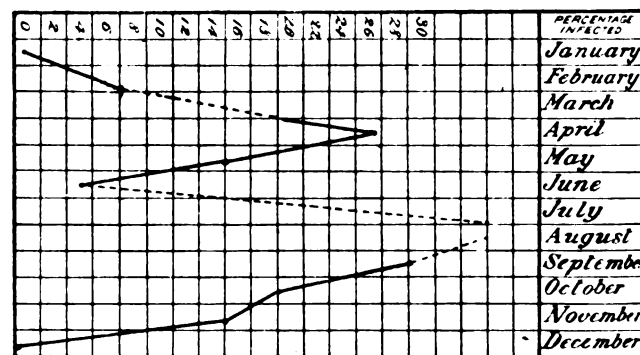
letter Ω in a lateral position; sometimes they formed a ring so complete that it resembled a small tertian ring, so that I was almost under the impression that I had discovered the long-sought-for form of transition. These rings, however, always again sprang apart, and in them the grain of chromatin always lay in that thick part of the ring forming the blasts, whereas in the ring-forms of the human malarial parasite the chromatin lies opposite to the thickest part of the ring.

The lively mobility of the blast became less after two or three hours and then ceased completely. They were generally fairly capable of resistance to transitory injuries. For instance, if dried up at 37°, and only again floated after five minutes they were still mobile. They could even withstand a short drying at 60° C. An addition of $\frac{1}{2}$ per cent. formalin had no effect on their mobility and only the mixing of glycerine with the formalin caused them immediately to be immovable.

After it had been confirmed that the development of the German proteosoma in the mosquito at high temperatures¹ took place regularly, and that, under some circumstances the blastic germs were already extant in the salivary glands on the seventh day, it was decided to find out at what degree of warmth—counting downwards—a development of the German proteosoma could still take place. From this experiment

it was proved that at a mean temperature of 20° C., provided the temperature was maintained between 16° and 24° C., the development of the cysts in the stomach of the mosquito was already delayed. For instance, the cysts, six days after the infection, were only double the size of a red blood corpuscle. Branch cysts were not observable. The further development of the cysts was irregular when the temperature varied between 15° and 23° C. In that case cysts containing crescentic bodies were still observable on the walls of the stomach eighteen, twenty-eight, and even thirty-five days after the infection, and empty cyst walls were also observed. Often the cysts which had proceeded to develop daughter cysts were permeated by vacuoles and degenerated, the middle lobes of the salivary glands being choked with blasts. The latter were partly mobile (eighteen days after the infection), partly immobile (forty-five days after infection).

The blasts developed between 16° and 24° C. were at first normal and virulent, as transmission to birds proved. If, however, the infected mosquitoes were kept in captivity and examined forty-five days after the infection it was found that, in a few, the blasts were still mobile, therefore living, and in others immobile, therefore dead. It therefore appears that only a portion of the blasts can remain alive longer than about six weeks in the salivary glands of the mosquitoes.

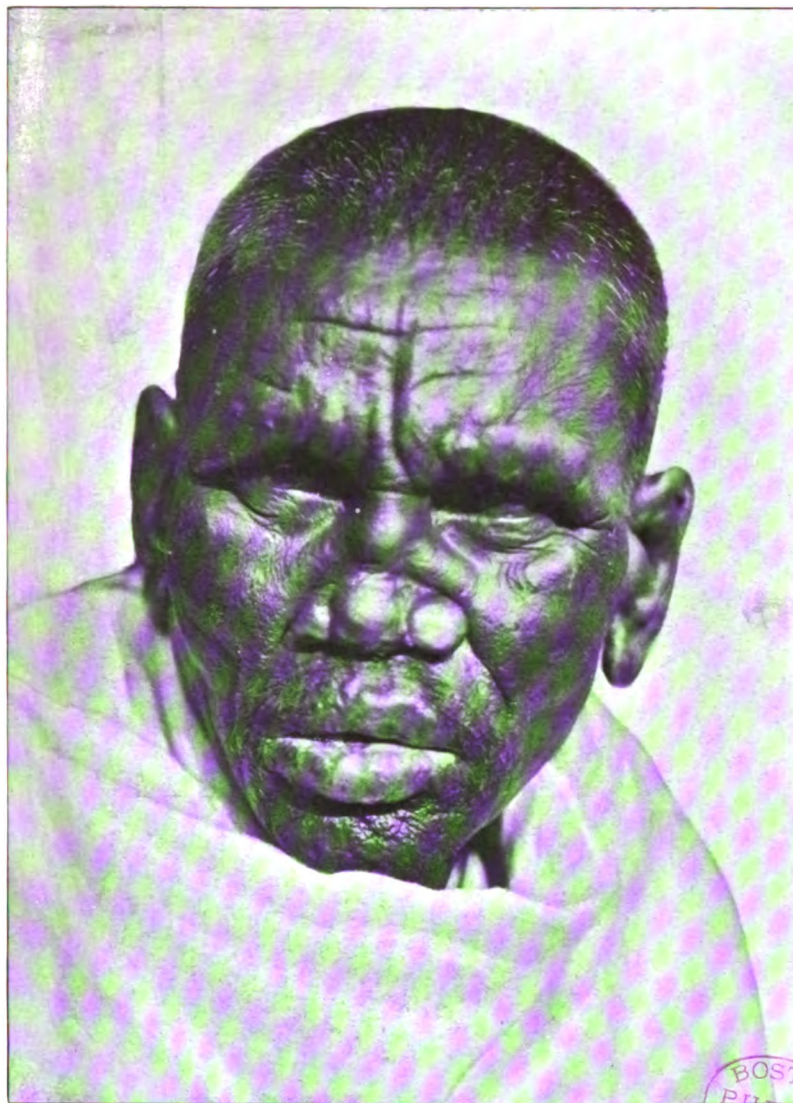


Course of Proteosomal Infection in Sparrows.

In this respect the table of the proteosomal infections gives an indication but no settled reply. From February to April the curve rises rapidly. At this time the mosquitoes (*Culex pipiens*) leave their winter quarters in increasing numbers, so that at the end of March, in Central Germany, no more mosquitoes are to be found in their winter quarters. The mosquitoes sting because they require blood to develop their previously fertilised eggs. These winter-gnats must therefore be responsible for the infection of the sparrows; for the proteosomal infections observed from February to April cannot be due to relapses, for one attack provides immunity.¹

¹ For this reason one can never say in advance if one is able to infect a wild sparrow newly caught by injecting proteosomal blood, for it is impossible to know if the bird has already gone through a natural proteosomal infection and has thereby acquired immunity. As to the results of my injections of blood containing proteosoma into wild sparrows, the old birds never became infected, the young ones rarely, and even then—with one single exception—the infection was very weak.

¹ Average temperature 24.5° C., and on the second day a minimum temperature of 20° C.



A LEPER'S HEAD.

Showing markedly the loss of Nasal Cartilages.

The infection must therefore be a fresh one. Besides, between February and April the mosquitoes do not find the temperature necessary for the development of the parasites which they may have imbibed by sucking the blood of sparrows. For, as proved, the proteosoma do not develop in the stomach of the mosquito when the temperature is between 16° and 20° C.

We must therefore take it for granted that *part of the blasts go through the winter*, and this opinion is borne out by the further course indicated on the table. The number of cases increases considerably in May and June. At this time the new generation of mosquitoes develops and, according to the conditions of temperature, the winged insects appear towards the end of April or middle of May. From that time to the end of June the temperature is as a rule not quite high enough to develop the proteosoma in the mosquitoes. Therefore the second batch of infections is conjectured to occur in August.

In conclusion, I may remark that the illness of canaries had a varying course, according to the manner of infection. When blood containing proteosoma was injected the typical course of disease, lasting twelve days, as described by Koch, was the result; if, however, the birds were bitten by infected mosquitoes (*Culex pipiens*), no matter if by one or several, the disease ran a chronic course and lasted on an average four weeks. In these cases, though at times 60 per cent. of the blood corpuscles were infected, the birds did not die; the birds treated with injections of blood often succumbed to the infection.

THE NEW PROPHYLAXIS AGAINST MALARIA.

AN ACCOUNT OF EXPERIMENTS IN LATIUM.

By PROFESSOR ANGELO CELLI.

THE modern theory of the propagation of malaria by means of mosquitoes had scarcely been confirmed experimentally, when, in my lectures in May and June of 1899 and shortly afterwards in book form,¹ I gave an exposition of the new epidemiology and the prophylaxis following from it. This, I pointed out, in order to be completely successful must be directed against (1) the causes bringing about infection, either by (a) destroying these (by disinfection of the blood of malarious persons and by the destruction of mosquitoes) or (b) by preventing their entrance into the human organism (by protection of dwelling houses and of the exposed parts of the body); and (2) against the predisposing causes (organic, physical, and social). In view of the arduous nature of any attempt to battle against the latter set of causes, I endeavoured (even before the commencement of the malarial season of 1899) to put into practice those only of the prophylactic measures which have for their aim the suppression of

the direct causes of the epidemic, that is to say, the causes bringing about infection. I was even then persuaded, and am now more than ever convinced, that a complete and certain prophylaxis by disinfection of the blood by means of quinine is practically impossible, although Koch, and later Gosio, and at first Grassi also, believed in its efficacy. And I had likewise come to the conclusion through my own and Casagrandi's researches² that, although the destruction of the mosquito in the aquatic and the aerial stages of its existence is in itself not a difficult thing, this is not practical on a large scale, chiefly because there is not the same immediate material advantage in killing insects which are injurious to man that there is in destroying those which are injurious, for example, to the grape-vine.

My first prophylactic experiments of 1899 had consequently for their object the testing of the means best adapted to prevent the bites of mosquitoes and the resulting penetration of the malarial germ into our bodies. On one hand, I made experiments with various substances, such as ointments, soaps, and odours, calculated to drive away mosquitoes, and satisfied myself that they were of little use, even the best of them, as, for instance, those with turpentine for their basis, either because of their ephemeral effect, especially in the open air, or because of the negligence of those employing them. On the other hand, I adopted the method of mechanical protection of the houses and of the exposed parts of the body, not omitting at the same time the disinfection of the blood by an assiduous attention both to relapses and to primary fevers, and the destruction of any mosquitoes which might accidentally penetrate into the houses. It will be well to refer here once more to the experiment which I made in the æstivo-autumnal season of 1899 on the two railway lines; notoriously malarious, of Prenestina-Cervara and of Pontegalera. I shall therefore give a brief *résumé* of the official report dated December 13 of last year. Of the first-mentioned of these two lines we selected for experiment the linesmen's cottages numbered 4, 5, 6, 7, and 8, and on the second those numbered 19, 20, and 21. We covered the windows with frames of tulle,³ thus allowing air and light, but no mosquitoes to pass. At the top of the staircase a door with a similar frame was placed, the better to protect the bedrooms. This door as well as the outer ones, was made to close automatically so as not to demand too much of human apathy. The entrance door, as being more liable to injury, was furnished with wire gauze instead of muslin. We advised the inmates to sleep with the windows open so that the air, filtered as it were from insects, might pass in freely. For the protection of persons employed on night duty, we used cowls like those of bee keepers, provided with a circular mask of wire gauze, and having attached to it below a veil

² *Per la Distruzione delle Zanzare, Mem. I. Annali d'Igiene Sperimentale*, vol. ix., 1899.

³ These frames were never removed from the windows of the first floor of cottage No. 19 on the Pontegalera line, and now, two years later, are in excellent preservation. For those who cannot afford metallic frames, the muslin ones may be recommended.

¹ "Malaria according to the New Researches" (Longmans, Green, and Co.).

tucked under the coat, at the ends of the sleeves of which very wide gloves of chamois skin were tightly sewn on. A vigilant outlook was daily kept for mosquitoes, in order to find and eventually to capture them in the houses. Every family was provided with a powder for burning in case by any chance a mosquito should make its way in. The neighbouring linemen's cottages and the stations of Cervara and Pontegalera served as controls. On the Prenestina-Cervara line Cottage No. 6 served the same purpose, the inmates being negligent and refractory and allowing mosquitoes to enter constantly. Some of the latter were found infected, so that we were able to predict the epidemic which afterwards developed, attacking twelve out of every fourteen inhabitants. Among the controls on the Cervara line twenty-four persons contracted malaria, and at the station of Cervara, renowned for its malaria, all were attacked. In the control zone of Pontegalera, two persons who had acquired immunity from having had the disease previously escaped infection. On the other hand, in the linemen's cottages which were protected, out of twenty-four persons four were attacked, but these were on night duty and took no heed of our instructions. Three of them were ill for a long time, two from tertian, spring and autumn varieties respectively, and one from quartan fever. In spite of quinine administered promptly and abundantly, they relapsed several times, and their blood contained a large number of gametes—that is to say, of those parasitic forms most dangerous for contagion. At the same time their wives and children living in the protected houses along with them enjoyed immunity from the fever. The disease did not therefore spread through a whole household in the usual way, and for the first time since the construction of these lines of railway, the families of the railway servants were able in highly malarious localities to pass the whole summer and autumn in the Campagna without contracting fever.⁶

The result of these experiments, which were the first of their kind in malarial districts, very greatly impressed Manson,⁶ who came to see my field of experiments at Cervara,⁷ and they induced the directorate of the Adriatic Railway Company to extend the system in Latium from Prenestina to Salone and on the Catelgiubileo line, and also into Southern Italy near the station of Ofantino in the Province of Foggia.⁸ The Southern Railways Company in its turn determined to extend the same experiments to the most malarious of the linemen's cottages on the lines of Terracina, Anzio, and Pontegalera, here in Latium, and to those near the station of Albanella in the province of Salerno. The conduct

of the former of these two experiments was entrusted to me; the other, in Southern Italy, to Grassi, who was member of a consultative committee appointed for the purpose by the same railway company.⁹ In like manner the Sicilian railways have also extended to the sections of their lines lying in malarial zones the same system of prevention. I must, however, limit myself to an account of the result of the new prophylaxis as obtained in Latium, where, encouraged and taught by the experience of last year, I attempted to defend against malaria in the season which is now drawing to a close, not only the railway servants, but also the caretakers in the Campagna, and the peasants. I shall now briefly recount what I did for each of these, and the results which I obtained.

A.—PROTECTION OF THE RAILWAY SERVANTS.

The method employed was that of the previous year, with the difference that wire gauze¹⁰ was everywhere substituted for the muslin, and that a large cage of wire gauze was placed in front of the door so as to form a kind of porch or ante-chamber. This addition of a porch, first suggested by Dr. Blessich, is very useful in giving greater protection to the rooms on the ground floor, and affording a shelter where in the summer the family can have the benefit of the open air without actually going outside. As a rule, the doors were made to close automatically, and to make sure that no mosquitoes entered by the chimneys the latter were also covered by gauze with a wider mesh. To render easier the discovery and destruction of any mosquitoes that might chance to enter, the walls of the rooms were whitewashed.

Large and repeated doses of quinine had been administered to any persons who had had relapses in the spring, as well as the very few patients with primary infections, the treatment being completed in all cases with arsenical and ferruginous preparations. No prophylactic medicine was given, except to those on night duty on the Adriatic lines, whom I had not been able to induce the previous year to wear regularly at night time the special head-gear and gloves provided for the purpose. They were made to take equinine in a daily dose of from 0.50 to 0.75 centigramme. On the Mediterranean lines we had not the same difficulty, because there mosquitoes and other insects are so numerous as to cause intolerable annoyance, apart from any danger of their conveying fever. The results which we obtained were briefly as follows:—

(1) Prenestina-Salone line. On this line we this year protected also the houses on the Cervara-Salone section which last year served us as controls. We were able, however, to use for this latter purpose the intermediate stations of Cervara and Salone as well

⁶ Vide *Bollettino*, 3 della Società per gli Studi della Malaria, Sitting of February 5, 1900.

⁷ *Brit. Med. Jour.*, February 10, 1900.

⁸ A very pleasing sequel to this visit was the experiments of Dr. Sambon and Dr. Low, who, in order to obtain documentary evidence, as it were, of the efficacy of the new prophylaxis, came and passed the malaria season on the most deadly spot in Ostia in a hut protected against mosquitoes, and who, together with two other persons, have remained all the time in perfect health.

⁹ Dr. Martirano, who has carried out the prophylactic experiments at Ofantino on twenty-eight persons, has not had a single case of primary malarial infection to report.

¹⁰ Professor Grassi published before the season had come to an end an anticipatory report, and this without any hint that others had been working before and were still at work for the railway company, and for the Society for the Study of Malaria, by whom the funds were supplied.

¹¹ The diameter of the mesh of the gauze should not be greater than two millimetres at most; this size prevents the entrance of any but a very small culex. To exclude all sizes of mosquitoes with certainty, the mesh should have a diameter of only from 1 to 1.5 millimetres. A coat of varnish is applied to preserve the netting.

as the section beyond, from Salone to Lunghezza. Now in the zone which was protected, out of fifty-two persons only two contracted fever—namely, a watchman on night duty, attacked on June 15 (before the commencement of the prophylactic treatment of those engaged in this dangerous service) and a woman attacked on October 15, who had always shown herself refractory to our recommendations. The watchman, notwithstanding abundant and repeated doses of quinine, had had three relapses at long intervals; nevertheless, his malaria did not prove infectious to the other seven persons who lived in the same house. In the rest of the protected zone fifty persons (twenty-one adults and twenty-nine children) remained free from fever. On the other hand, in the zone of control, two out of three persons sickened at the station of Cervara, sixteen out of eighteen on the Salone-Lunghezza section, six out of ten in the station of Salone—the four who escaped having been in the habit of frequently sleeping at Rome—and in the houses of the country people along the protected portion of line, and in the huts of Salone there were about 100 peasants, all of whom sickened. Also on the farms of Rustica, Cervelletta, Bocca di Leone, and Gottifredi all, or nearly all, took the fever. *Our protected zone thus remained almost free from malaria in the midst of a fever-stricken region, and in order to render healthy a district where during the preceding year everyone had had fever, it sufficed to extend to it the new method of prophylaxis.*

(2) Castelgiubileo line (from the seventh to the nineteenth kilometer inclusive). On this line the experiment succeeded in a degree highly convincing. Here there are two types of linemen's cottage—the new and the old; the latter from its peculiar construction does not lend itself to being protected, and was therefore left to serve the purpose of control. This turned out to be a fortunate circumstance, because the old and the new cottages as nearly as possible alternate with one another. Now in the protected houses, out of fifty-seven inhabitants not one took fever, while in the unprotected houses, out of fifty-one inhabitants only seven escaped, and these were nearly all adults, immune in consequence of previous attacks. Among the children, on the other hand, only two out of twenty-nine escaped infection in the unprotected huts, whilst of the thirty-six children in the protected houses not one was attacked. We also made two further control experiments. On August 23, it became necessary, for reasons connected with the railway service, to transfer a family consisting of a husband, wife and son, from cottage No. 17, where they had always enjoyed good health, to the next cottage, No. 16. About a month afterwards the wife and child were attacked by fever. On the other hand, a family consisting of husband, wife, and six children, all of them suffering from malaria, had been placed in cottage No. 17. We at once put them upon a full and prolonged course of quinine followed by tonic treatment with arsenic and iron. Secure in their protected house from the baleful mosquito, this family has made an excellent recovery, although their convalescence and cure had to go on through the height of the malarial season. Only one of the children, in whom the relapses were more obstinate,

still remains in somewhat poor condition. On this Castelgiubileo line the proof of the value of the new prophylaxis has thus been most decisive and eloquent. *Of a whole community of persons all subjected to the same conditions in other respects, those whom we defended against mosquitoes have remained free from fever, whilst those left unprotected have nearly all been attacked.* It is as if we had a book with its pages alternately white pages corresponding to our protected houses and families, the black representing those left unprotected. No less decisive in their results were the experiments made on the other lines.

(3) Pontegalera line. Here, in the section outside of the protected zone, cottages Nos. 15 to 19 inclusive, out of forty-two railway servants, only three escaped the fever. In our protected zone, on the other hand, out of thirty-six persons only two contracted it, while in the section further on from the twenty-seventh to the thirty-third kilometre, out of ten persons only one remained unattacked. As further controls we had the station of Pontegalera placed almost in the midst of our zone of experiment, where out of seven persons six were attacked; the first lineman's cottage on the Fiumicino railway, where all of the three inmates suffered, and some neighbouring country cottages in which at Chiesola thirty inmates out of thirty were attacked, at the hamlet of Pontegalera four out of four, and at a house placed almost midway between two of the protected railway cottages, twelve persons out of twelve.

(4) The Anzio line. Here we selected—for protection, the two cottages most noted for malaria—namely, those at the twenty-fifth and thirty-second kilometre. Now in these two cottages, in each of which were four persons, all remained perfectly well, and four other persons, who came from the Terracina line to live in them suffering severely from malaria, recovered their health completely. On the other hand, in the cottages from the eighteenth to the twenty-third kilometre, out of thirty-nine inmates thirty-eight sickened with fever; in the cottages lying between the two protected ones nine out of nine; and in those beyond our No. 32 cottage eight out of ten. Among a squad of linemen numbering six there were four fever patients, the two who escaped belonging to the family protected by me at the twenty-fifth kilometre.

(5) The Terracina line. In the railway cottages along this line, so terribly malarious, I had thirty persons protected between the station of Frasso and Terracina. Of these only two suffered from primary infections—namely, a lineman who by mistake went on night duty without his mosquito hood, and a little girl who had had quartan fever. In two persons who had become malarial cachectics during the previous two years æstivo-autumnal attacks recurred with obstinacy up to the first few days of October, in spite of treatment. None of the others had malaria. On this line also I was able to establish a series of controls analogous to those I have described on the Castelgiubileo line by leaving here and there cottages unprotected. Of thirty-seven persons inhabiting these latter thirty-five took fever.

To sum up, of 207 railway employes subjected to the new prophylaxis against malaria during the seasons

1899 and 1900 only ten contracted fever, although they were living in the most unhealthy regions of Latium and in the midst of their fellows, all or nearly all, of whom were stricken by the disease. Also, in houses defended against the invasion of mosquitoes, malaria loses its contagiousness and no longer gives rise to the usual epidemic. Further, the treatment of, and convalescence from, malarial fever, can be carried on in malarious localities, in houses protected from the invasion of mosquitoes, quite as well as in places where the air is good.

It is to be noted, in conclusion, that this favourable result was obtained with the utmost simplicity, all that was necessary being a little persuasion with a small present, and the supervision which I and two railway officials who assisted me, one on the Adriatic and the other on the Mediterranean railways, were able to exercise. A similar result could therefore be attained wherever and whenever desired, and I am able to say that these two railway companies propose to secure it on the largest possible scale.

B.—PROTECTION OF THE CARETAKERS IN THE CAMPAGNA.

Two Roman companies—namely, the Società dell' Acqua Marcia and the Società dell' Elettricità—have each a caretaker's house on the road from Rome to Tivoli, both situated in localities with a bad type of malaria which has hitherto attacked families residing in them every year; or rather, I should say, the wives and the five children, for the husbands, owing to many years of past suffering from the disease, have become immune. This year for the first time the wives and children have escaped infection, and this immunity they owe to my having had their houses protected before the malaria season, in the same way as those of the railway people, with wire netting. As I had here to deal with persons of intelligence who could be trusted to carry out my instructions carefully, I left this experiment to proceed, as it were, of its own accord. At the beginning of the season I went with the companies' engineers, first to order, and then to approve, the protective arrangements for the houses. I gave the requisite instructions (to remain indoors from an hour before sunset till an hour after sunrise, and to kill any mosquitoes that might accidentally gain entrance) and after that I did not return. From the engineers, however, I have from time to time received news of the welfare of these people, together with thanks for the danger escaped. The same protection may thus be secured whenever they desire, by all the caretakers of the communal, provincial, and Government roads, of monuments, and of the works for reclaiming waste lands in the many malarious districts of Italy.

C.—PROTECTION OF THE PEASANTS.

Malaria rages most of all among the field labourers, working as these do in the most dangerous hours of the evening and night at the most unhealthy time of year—namely, when the principal crops are reaped—living in habitations of a wretched or defective kind—or without any habitation whatever—and withal very insufficiently clad. Such conditions render it very difficult to carry out among these people the pro-

phylactic measures which would be, and ought yet to become, of the greatest benefit to them socially. I wanted notwithstanding this to make the attempt. Accordingly, I protected in the usual way, with nets over the windows and doors, the farm of "Le Castella" and about half of the hamlet of the "Cervelletta." Among the houses so protected on the latter farm was one with a terrible reputation for the number of victims which malaria had yearly claimed from it, so that the proprietor wished to shut it up. Below this house, in which two families (six persons) were going to live, was another, a sort of tavern, which I also protected with the netting. And, finally, I determined to make the same experiment with that most primitive of all human habitations, the straw hut, closing thoroughly with straw all the holes in its sides, and with wire gauze the openings for allowing the smoke to escape; I placed at its entrance a big cage of the same material, furnished in its turn with two doors made to close automatically. I protected three huts in this way, two at the Cervelletta and one at the Castella.

It is more difficult to induce half-educated people to believe that malaria may be conveyed by the bites of mosquitoes than it is to convince the ignorant peasantry of the fact. On this account I met with much less difficulty from some of the more intelligent among the latter than I had expected in getting them to carry out the new prophylaxis so as to insure success.

In the hamlet of the Castella, the family of the manager and the medical man of the Red Cross Society escaped infection, notwithstanding that some stagnant water from a ditch, which was brought in the house in an old cask, might have developed many mosquitoes. So also the seventeen Lombard peasants who slept in the protected part of the hamlet of Cervelletta were rewarded for the great care they took by only one of their number falling sick with malaria, a man who was in the habit of getting drunk from time to time, and while in this helpless state, of sleeping in the open air. In the part of this hamlet which served as control, we had at the same time ten cases of primary infection and several relapses from the previous year's epidemic. And the house so cursed with the disease in former years had no fresh cases in it. One family was, however, obliged to leave its protection in the early days of September, and now (between October 15 and 17) the two children have already contracted fever.

In the midst of the other straw huts all stricken with malaria, the protected hut at the Castella, with a family, consisting of father (a very industrious man), mother and three children, remained, wonderful to relate, quite free from fever, as did also one of the protected huts at the Cervelletta with five inmates—father and mother and three children. In this latter hut we never found mosquitoes; a few which found their way as far as the outside cage were killed. On the other hand, in the third protected hut, notwithstanding all our warnings we found mosquitoes in the cage every morning and also often inside the hut itself. Finding it impossible to induce this family, on account of their apathy or their ignorance to take the necessary precautions, we removed the protection,

and three out of four of the inhabitants took fever. Thus, so long as the peasants were careful, they were able to defend themselves from malaria even in the most primitive of dwellings, the straw hut.

In order to protect from fever the nomadic rural population who come down to the Campagna at the season when the most dangerous kind of work is in progress, and who are easily infected on account of their sleeping in the open, the Caetani family are making a preliminary trial in the Pontine Marshes of a large hut constructed of wood and wire-gauze which can be taken to pieces and transported to wherever it is wanted.

Naturally, in order to make quite complete what we may call this mechanical prophylaxis, for the peasantry it would be necessary to stop their work in the more dangerous hours. Besides this, one must not lose sight of the ideal kind of prophylaxis for people who work—namely, that of making them artificially immune against the disease. With this object in view I have made, and continue to make many experiments, especially with euquinine, and I propose shortly to give an account of the results obtained by this medicinal method of procuring immunity. For the present I wish to insist upon the fact that by means of the mechanical prophylaxis for malaria (protecting the houses and the uncovered parts of the body) a great step in advance has been made for practical purposes. Among railway employés, caretakers and even the peasants of the malarious Campagna, the lesson of the last two years has been so persuasive that all of those who have hitherto served as controls are anxious to be protected during the next fever season. Within no very distant date all houses in malarious localities will be defended against the entrance of insects; thus during the day there will be no inconvenience from flies and other insects of an unclean, troublesome, or injurious kind, and at night there will not be the annoyance and evil effects of mosquitoes. In all low-lying, warm, moist, places, where myriads of insects of every species swarm, this mechanical means of defence against their invasions will become the best of the prophylactic rules for the prevention of malaria and other diseases.—Specially translated from the *Supplemento al Policlinico Anno VI.*, No. 51, for the *Civil and Military Gazette*.

[This is the best translation of Prof. Celli's work we have seen, and we are indebted to Major P. W. O'Gorman, I.M.S., for drawing our attention to it.—ED.]

Current Literature.

CHOLERA.

EXTRACTS FROM THE PAMPHLET ON PRECAUTIONS AND SUGGESTIONS FOR THE PREVENTION AND CHECK OF CHOLERA, BASED CHIEFLY ON PROFESSOR HANKIN'S BOOK, "CHOLERA IN INDIAN CANTONMENTS." By Colonel Duke, I.M.S., Principal Medical Officer P.F.F., Abbottabad.

This valuable code of rules, drawn up for the use of medical officers as well as the laity by Colonel Duke, and revised by Professor Hankin, should be widely distributed in India and elsewhere. It is the best practical guide how to ward off cholera we know of. We should have liked to publish the entire pamphlet, but the extracts we give will show the useful nature of the communication. Copies of the pamphlet are obtainable at The Punjab Frontier Force Press, Abbottabad-Punjab. Price 3 annas.

(1) The cholera microbe, outside the human body, so far as is known, only *lives* and *reproduces* in water.

(2) It is one of the easiest microbes to kill by antiseptics or by long exposure to sunlight.

(3) It is rapidly and easily destroyed by *boiling*.

(4) Boiled water is absolutely safe.

(5) Two or three minutes' real boiling is sufficient.

(6) The cholera microbe is rapidly destroyed by *drying*. Hence mattresses and clothing, supposed to be infected, should, when possible, be exposed to sunlight in the open air for some hours before washing.

(7) It is readily killed by *acids*; hence the utility of acid drinks as a means of preventing infection.

(8) In cholera times soldiers should be encouraged to drink aerated water. Further, the addition of 10 drops of diluted sulphuric acid to each bottle of lemonade before bottling during a cholera epidemic has been recommended.

(9) Cook house floors should be daily washed with permanganate of potassium solution. Strength, half an ounce to each bucket of water.

(10) All wells must periodically be disinfected by permanganate of potassium; say, roughly, one ounce to every three feet in depth of water. If possible, the permanganate should be added at night in order to leave the wells undisturbed as long as possible. The water will be fit to drink on the following morning. If at this time the water has a red colour, it will have a slightly unpleasant taste, but it is perfectly harmless. If the inhabitants do not like the taste they should be instructed to pump out the water until the colour vanishes. This treatment should be repeated once a week.

(11) In cantonments, on the other hand, to each well should be added, *firstly*, 5 lbs., more or less, of hydrochloric acid. When this has been mixed with the water, an equal amount of permanganate may be added and mixed by means of a chursa. After a few hours the water may be pumped out until the colour has almost vanished. This may take one or two days to do.

(12) The mixture of permanganate and hydrochloric acid, *at the moment of mixing but not after*, liberates nascent chlorine ozone, &c., and hence is one of the strongest antiseptics known; and is believed by Professor Hankin to be powerful enough to kill the enteric microbe in a well.

(13) The above procedure is not suitable for villages (a) for obvious reasons, (b) because the addition of a liquid to the well water hurts caste prejudices. A purely Mahomedan village would probably raise no objection. Owing to the existence of caste prejudices, it cannot be expected that Hindoo villagers will allow a Mussulman Hospital Assistant to put permanganate in the wells from

which they obtain their drinking water; therefore an Englishman should always be employed to do this work. During the famine of 1896, all the wells at a certain relief work were permanganated by the Babus in charge, and the starving people remained free from cholera. The Babus, however, did not put permanganate in the well used by themselves; they were accordingly attacked with cholera, and most of them died.

(14) After a well has been thoroughly disinfected, no *outside* vessel should be lowered into the water, one *special zinc or iron bucket only* should be used to draw up water.

(15) It is advisable, where possible, to have a special permanganated well for bathing and washing clothes, otherwise infected water might be used for the purpose.

(16) All mussucks, packals and dhols should be paraded and disinfected with a strong solution of (a) carbolic acid, strength 1-20, or (b) of permanganate of potassium, say for mussucks 2 to 4 drachms (ʒii. to ʒiv.), two to four tea-spoonfuls; for packals 4 drachms to 1 ounce (ʒiv. to ʒi.), one to two table-spoonfuls; for dhols 2 drachms (ʒii.), two teaspoonfuls. A hot solution should be used, and the skins shaken occasionally from 6 p.m. to 5 a.m.

(17) Earthen vessels containing *milk, dahi* or *curds* require special attention. Chatties and surahis used by soldiers for holding drinking water should be abolished during cholera times; at other times they should be broken or replaced once a week. It is advisable to abolish the use of porous earthenware vessels altogether. The only reason for employing them is their cooling effect on water.

(18) Should cholera hang about a cantonment it is advisable to have a parade of *all* vessels used for storing water, milk, or food outside each quarter, both married and single. Under medical supervision such vessels are filled with strong disinfecting solution, and kept outside for a period of eight to twelve hours, say 7 p.m. to 5 a.m.

(19) Regarding its origin, an outbreak of cholera is almost invariably traced to tainted water or watered milk.

(20) At the outset, the discovery of the (locality of the microbe) source of infection is of vital importance. If the microbe can be traced and destroyed the removal of the troops is not so essential as was formerly supposed and authoritatively laid down. In July, 1894, during the dreadful outbreak of cholera in the East Lancashire Regiment that occurred at Lucknow, Professor Hankin found the cholera microbes in the filters which were strongly affected. These filters were carried with the regiment into camp, continuing to deal death and destruction.

(21) Regarding the continuance of cholera in a camp for a day or so after the first removal, it must be borne in mind that the incubation period in the majority of cases is considered to be from forty-eight to seventy-two hours.

(22) Barracks and huts in which the floor or walls have been soiled with dejecta or vomit, as often happens, should be covered or brushed over with a strong solution of carbolic acid commercial, 1 part in

20 of water, after their vacation, and then left alone. Whenever doing so will not involve the risk of fire, earthen or cement floors are preferably disinfected by covering them to a depth of two or three inches with straw, sticks or other inflammable material and setting light to it. Cowdung floors are not affected by carbolic acid, and should be treated either by burning, or by a solution containing 1 in 1,000 of sublimate of mercury, and 2 in 1,000 of hydrochloric acid.

(23) If the digging of floors is done at once, as was formerly advised, those engaged in the removal of the soil are liable to infection.

(23a) In damp localities, especially where cholera is epidemic, the microbe may exist for long periods in black stagnant mud near puddles. Natives using such mud to scrub their lotas may carry infection to their food or to a well. The level of such damp places should be raised by covering them with clean dry earth. If near cookhouses carbolic acid may be used in quantity. But such stagnant mud is difficult to disinfect, and ordinarily more reliance should be placed on the effect of draining and raising the level.

(23b) A supply of carbolic powder should be provided for latrines. This may not be a strong antiseptic, but its action is that of a smelling substance that remains on the surface of the soil, and hence discourages flies.

(24) The dejecta of cholera patients are dangerous because they contain the microbe of the disease. Therefore the bhistic should never be allowed to come into a hospital to aid the sweeper cleaning up cholera dejecta for fear his mussuck should get contaminated. All stools should be disinfected by carbolic acid commercial 1 part, to water 20 parts.

(25) Attendants on cholera patients whose hands and persons are soiled by dejecta or vomit, should most carefully wash their hands and arms in a strong disinfectant before taking food. Men told off to attend the burial or burning of corpses should be equally careful. The touching even of the moustache with unwashed hands when attending a friend or comrade may cause fatal results.

(26) A special sweeper, who must do no other work, should be told off for the kitchen or kitchens. His broom should be kept hung on a nail outside the door of the cookhouse. It is most important that the broom used in the cookhouse should not be used for cleaning latrines or objectionable filth. It is wiser still to exclude the sweeper altogether from the kitchen, and insist on the cook cleaning his own kitchen. In the Bombay Presidency, it is usual to have a special servant for such work known as the "hamal."

(27) The floor of the cookhouse must be daily washed with permanganate.

(28) Before entering a cookhouse, the cook and musalchi should be made to wash under special supervision. They should put on clean clothing or dhoties that have been boiled or dried in a hot case. Their other clothing should be left out in the sun.

(29) Dishes and plates should be washed in boiled water, with the addition of a cupful of diluted sulphuric acid to each bucket.

(30) Water should be boiled in locked tins with a tap, and not filtered afterwards.

(31) Milk and all kinds of food must be carefully protected from flies.

(32) Caution is here repeated against uncooked vegetable, salads, cucumber, &c., that may have been washed or stood in infected water. The only safe food is food that has just been cooked, owing to many loopholes of infection—hands of cooks, flies, washing-up water utensils, &c.

(33) Jharans, or dishcloths, should be well dried every day. This can be conveniently done in a hot case.

(34) The musalchi's mop should be cremated. Either a new mop should be given him daily for washing the plates, or a pair of tongs with sliding rings with which he can hold a dishcloth for the purpose. After use the dishcloth can be removed from the tongs, cleaned and spread in the sun to dry.

Indian expressions used in above article.—Dhol=an iron bucket; chursa=a butcher's knife; mussucks=water vessels, made of hides and carried by bhisties=water carriers; packals=mussucks carried by animals; lotas=brass vessels; musalchi=cook's assistant; dhoties=loin cloths.

PLAGUE.

SOME PRACTICAL NOTES ON THE BACTERIOLOGICAL DIAGNOSIS OF HUMAN PLAGUE (PESTIS HOMINIS), BY SHERIDAN DELÉPINE, M.D. — This article (*Indian Medical Record*, January 9, 1901) is, according to the author, based on experiments carried out in his laboratory with a culture of bacillus pestis kindly given to him by Dr. Calmette in April last. This culture was used chiefly for the purpose of repeating experiments of previous observers, Yersin and Kitasato more especially. The culture had been obtained by Dr. Calmette from a case of plague in Oporto (1899), and was so virulent in April last that it was sufficient to prick the skin of a guinea-pig with a needle loaded with bacilli to produce an attack of the disease fatal in about five days.

Having first touched on the discovery of the plague by Yersin and Kitasato in Hong Kong during 1896, the author next discourses on "Types or varieties of plague;" he considers the varieties depend (1) on the channel of entrance, (2) the virulence, and (3) the quantity of the bacillus. Dr. Delépine differentiates five types.

- (1) The bubonic type.
- (2) Septicæmic plague.
- (3) Pulmonary form.
- (4) Intestinal form.
- (5) Cutaneous form.

As to the diagnosis of plague by experimental infection, the observer used two methods for this purpose:—

(1) *Subcutaneous inoculation*, for which mice and guinea-pigs are especially suitable.

(2) *Infection through the air passages*, obtained by painting the nostrils with the products under investigation. This method is specially suitable when products of low virulence are under investigation—as for instance, the pus of suppurating buboes. (In suppurating buboes the plague bacilli, when found, are usually in a state of degeneration and frequently

of low virulence.) For this method of experimental infection the guinea-pig is specially suitable.

Dr. Delépine suggests that in practice microscopical examinations should be initially made:—

(1) Of material obtained from a bubo or from the œdematous tissue surrounding it.

(2) Of blood obtained from the tip of a finger or from the lobe of the ear.

(3) Of the expectoration in suspicious cases of pneumonia.

Such an examination presents no difficulties and can be quickly carried out. Almost any of the aniline dyes in common use can be used for the purpose of staining cover-glass preparations of material obtained with the hypodermic syringe from buboes or their neighbourhood. Freshly prepared aqueous solutions of methyl violet, aqueous solutions of methylene blue, or Loeffler's blue may be used.

Dr. Delépine devotes a paragraph to "Cultivation of the Bacillus," and concludes his careful and interesting article with "Precautions against Laboratory Plague," which though mentioned last is of primary importance, for many investigators, in the excess of their zeal, forget the danger of their work and recklessly expose themselves to infection.

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British and Colonial Druggist.

British Journal of Dermatology.

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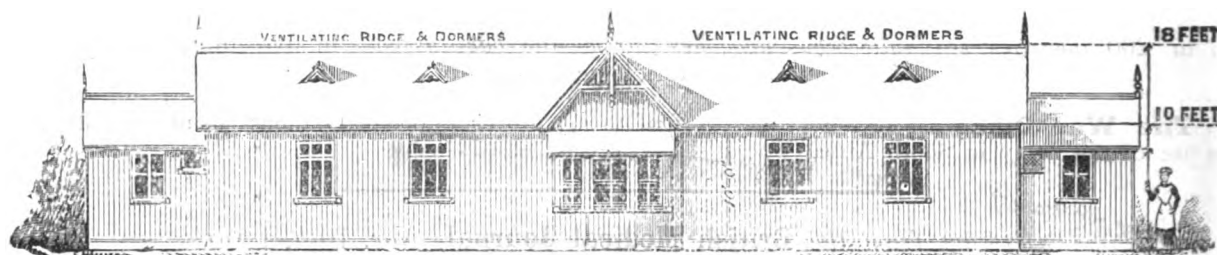
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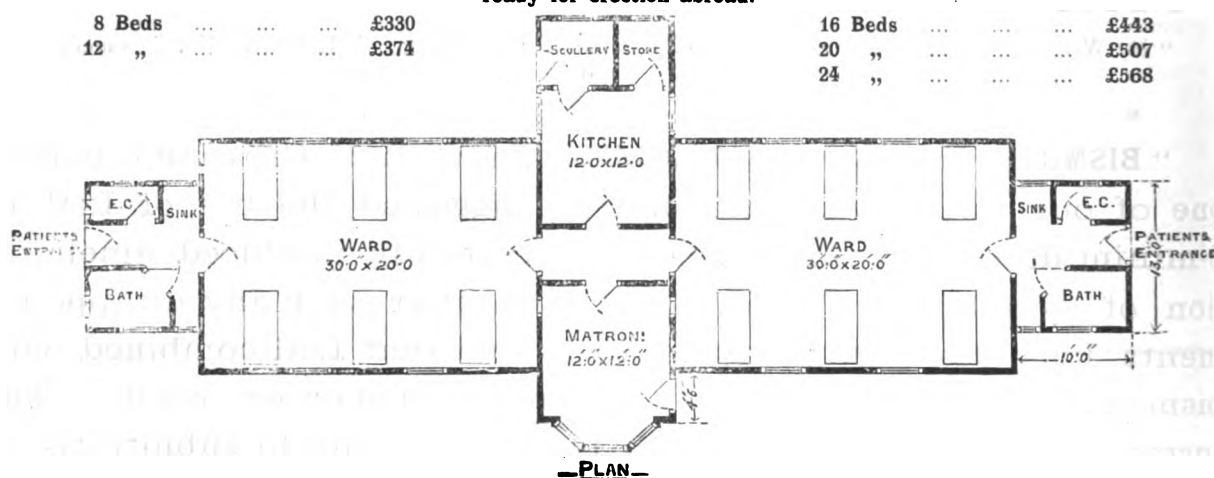
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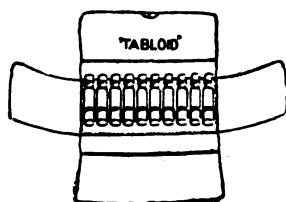
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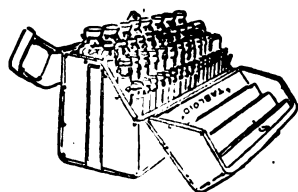
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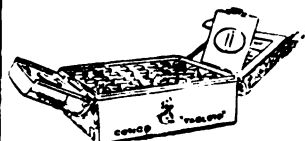
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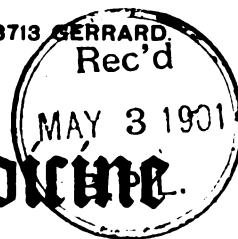
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A CASE OF ACUTE LYMPHATIC LEUKÆMIA SUPERVENING ON MALARIA.

By J. PRESTON MAXWELL, M.B., B.S., F.R.C.S.
Changpoo, Amoy, China.

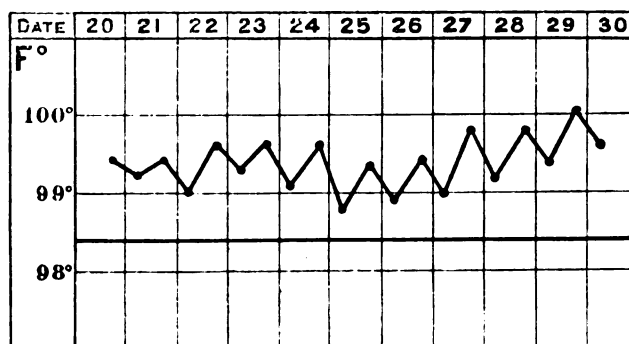
MANSON, in his work on "Tropical Diseases," uses the following words: "It is probable that splenic leukæmia is in some instances a remote effect of malaria." The sentence is interesting viewed in the light of the case recorded below:—

Ang-Ria, male, aged 36, has been under observation for the last two years with occasional attacks of malaria. On one of these occasions his blood was examined and a benign tertian infection noted.

On November 2, 1900, he came to the Changpoo Hospital complaining of weakness and fever. His blood was examined and found to contain æstivo-autumnal parasites of the malignant tertian form. He was treated with quinine and his fever ceased, but he only stayed a week or so in hospital and left against my wish. He was not at the time markedly anæmic. On December 20, 1900, he returned, looking wretched and anæmic. His own statement was that his fever had not returned, and that he had remained better for fourteen days after leaving the hospital, but at the close of this time had rapidly become worse, and unable for work owing to weariness and weakness. He was admitted to hospital and his blood examined. There were no malaria parasites visible in the peripheral blood. The blood count was as follows: red corpuscles 1,200,000, hæmoglobin 15 per cent., white corpuscles 1-10. The latter were almost exclusively large and small lymphocytes, and the stained slides were typical of the disease known as lymphatic leucocythæmia. The spleen was not palpable. The man was thin and the lymphatic glands could be easily palpated in exposed situations, but were not markedly enlarged. They were firmer than usual, freely movable and not tender. There was no tenderness or

enlargement about the bones. The temperature was persistently raised, never reaching normal the whole time he stayed in hospital. His pulse was slightly quickened but poor in tension. No other organic disease could be discovered, and nothing abnormal was found in heart or lungs. The urine was pale, sp. gr. 1012, no albumen nor sugar. Slight œdema was present in both legs. The stools contained a few round worm ova but no ankylostomiasis. He was very constipated.

Treatment consisted of keeping the bowels open, and administering nourishing food with iron, arsenic and quinine. In spite of this he rapidly became worse and died of exhaustion on December 31. No post mortem of course was obtainable.



Acute lymphatic leukæmia is a rare disease and one which is as yet hardly understood. In this case it supervened directly upon a malarial attack, its duration was between four and five weeks and its progress was steady. No rigors were noted and bleeding was not a marked feature. One attack of hæmorrhage from the nose occurred and was only moderate in amount. At the same time fear of hæmorrhage made me refuse to remove an offending molar which the patient was extremely anxious to get rid of. The proportion of white corpuscles to red was in this case

greater than in the majority of cases of lymphatic leukæmia, 1-30 being a more frequent proportion. One marked feature about the case was the persistent depression which affected the patient. Generally a cheery individual, he became irritable and possessed with the idea he was going to die, and this he never shook off. At the same time his mind was quite clear up to the time of his death. As to the exact connection, if any, between this disease and the preceding malarial attack, I am in the dark, but it emphasises the necessity for a careful examination of the blood in cases of anæmia. Without such examination a case like the foregoing might easily have been mistaken for malarial cachexia.

NOTE ON THE TREATMENT OF DYSENTERY.

By M. D. EDER, B.Sc.Lond., M.R.C.S., L.R.C.P.
Palmyra, Colombia.

As every country is allowed its distinctive dysentery, I limit myself to the treatment of the disease as it occurs here; clinically it seems to be the same as in other parts of the globe. Firstly, as to food. An examination question once put me was: "Why is milk called a perfect food?" The question, one of my few remaining physiological assets, to my thinking supplies the reason why milk so often disagrees with dysenteric cases—especially the subacute forms. (Milk is often objectionable in other inflammatory bowel complaints, e.g., in sprue, as pointed out by Mr. Cantlie.) If it be entirely a question of the harmfulness of the faecal residue, it may be that it is one of quality rather than of quantity; possibly the faecal residue from milk is more irritant to the inflamed bowel than that derived from other food stuffs.

A practical difficulty is that milk is unobtainable till late in the day except in very large towns. Beef-tea, soups and broths are useless and harmful. Meat, boiled or roasted and finely chopped, I have found the best form of food. In tardy cases I have found over and over again that on changing a milk diet to a meat one improvement has immediately set in. The principal objection to the meat diet here is that fresh meat in most places can be had only once or twice a week; one has therefore to fall back on the common sun-cured beef. Where a greater variety of food is offered, mutton, goat and fresh fish would lessen one's difficulties. In addition one gives the white of eggs beaten up with sugar and water; rice and corn flour as progress is made. Decoctions of simaruba or cinnamon accompany the diet.

Drugs.—So high an authority as Osler inclines to an expectant treatment. My experience of this has been somewhat large and unfortunate. Many sufferers are content to remain in bed drinking camomile or peppermint teas until a gangrenous dysentery occurs; then urgent summonses for priest and doctor. The former being the only one really needed. I have not yet seen a case of gangrenous dysentery recover.

In all acute cases ipecacuanha has given me far better results than the treatment by sulphates, to which I once gave a fair trial. Ipecacuanha is not followed by greater depression than caused by the

salts. The de-emetinised tabloids (B., W. & Co.) were disappointing; causing much the same depression, &c., with less relief than the powder containing all the alkaloids. The general formula for adults is 50 to 60 centigrammes of powdered ipecacuanha with 15 to 20 centigrammes of benzo-naphthol or betol, in an emulsion every two hours throughout the day. The treatment is continued for two or three days, until the stools lose their dysenteric character. For the tenesmus and general pain morphia hypodermically answers best. The most useful drug for the post-dysenteric diarrhoea is the strong lactic acid; but it requires to be given in full doses, say 50 centigrammes, with a few drops of paregoric, every two hours. I have no statistics to offer, and few deaths to report when patients present themselves for treatment reasonably early.

A CASE OF LUPUS IN SINGAPORE.

By LIM BOON KENG, M.B., C.M. Edin.

LUPUS A RARE DISEASE IN THE STRAITS SETTLEMENTS.

THE portrait is that of a young Chinese, age 20, a house servant, who hailed from the island of Hainan, South China. The case is clearly one of *lupus vulgaris*, whose destructive character is well shown. The cicatrices and consequent contraction have nearly obliterated the nostrils and have totally destroyed the mobility of the lips. The mouth becomes a small



aperture, which remains open and allows the saliva to trickle away the whole time. The left eye was destroyed some years ago; the right one is just being attacked. The apple-jelly-like crusts may be seen in a group over the right eyebrow.

The chief interest in the case lies in its rarity in this part of the world. During more than seven years' practice, and moving freely among the natives, I have only come across this single case. In a country where

tertiary syphilis is common and tubercular leprosy is an everyday eyesore, lupus deserves some attention at the hands of the medical man. There is one form of leprosy—the combined tubercular and maculo-anæsthetic—which, superficially looked at, is not at all unlike the present case. But no medical man can possibly confound the two. In leprosy there is not the same amount of destruction and rapid repair, and besides the crusts, appearance and *odour* are different.

From tertiary syphilis it is distinguished by the history of the case, but generally, in such an extensive destruction as represented in the photograph, syphilis would have produced enormous gaps by sloughing, and the scars would by no means have been so conservative. The nasal bones would have necrosed long ago, whereas in the present case they remain intact. The fact that phthisis pulmonalis is quite common here is of some importance in connection with the rarity of all forms of superficial tubercular growths. But on this point I hope to be able to furnish you further particulars at another time.

ON YAWS AS OBSERVED IN FIJI.

A REPORT PRESENTED TO THE STANDING COMMITTEE ON YAWS, POLYCLINIC, LONDON, MARCH 28, 1901.

BY MORGAN FINUCANE, M.R.C.S., L.S.A.
Assistant Medical Officer, Fiji.

I HAVE commenced my paper by asking "What is Coko or Fijian Yaws? is it a modified form of syphilis?" I am well aware that such a question is not a new one, and that a distinguished authority holds all yaws to be "modified syphilis." The following clinical observations must, however, be taken to represent solely my own views, formed after an intimate acquaintance with Fijian yaws as observed during seven years residence in the Islands of Fiji. During that period I travelled through the greater portion of Viti Levu, living and sleeping amongst the natives in their houses by day and night, and it was part of my duty to investigate and treat yaws cases.

The latest medical literature¹ that I have read on yaws does not to my mind accurately describe "Fijian yaws," which I take to be as modified a form—in another race—of the disease, "Frambœsia," as I submit Fijian yaws is a "modified syphilis" allied to though not identical with what we know in Europe as syphilis.

Therefore it is that, as compared with West Indian or West African yaws, Fijian yaws is somewhat distinct, presenting clinical characters so overwhelmingly in favour of a syphilitic origin as to be beyond dispute or argument, and for all practical purposes, as to treatment, identical.

We may assume that the syphilitic poison introduced into the Fijian race—probably from Tonga—by early voyagers to the South Seas in the latter part of the last and beginning of the present century, and recognised by Captain Cook and others under the various local names in the different groups of islands,

took on first an epidemic character and settled down to the modified form we now see, and which is called by Fijians "Coko." It is possible, however, that the disease may have been present in Fiji for a much longer period than that suggested.

That I have some authority for asserting that this may be the case, will be seen on reference to a distinguished authority, Mr. Berkeley Hill, who in his work on Syphilis, after describing the various forms of unrecognised syphilis says, "that many of the affections in secluded districts spreading among individuals of similar habits, acquired special characters somewhat varying from ordinary syphilis," and it is not unnatural to assume in a new race a new type of the disease. Amongst the diseases mentioned and included by Berkeley Hill is yaws (frambœsia or pian); and a learned report on the "Decrease of the Native Population in Fiji,"² published in 1896, characterises coko, or Fijian yaws, as the same as sibbens or sivvens, an epidemic disease prevalent in Scotland as late as the present century. It is remarkable that Berkeley Hill claims the disease "sibbens" as a modified form of syphilis.

Coko, or Fijian yaws, is endemic in Fiji, and scarcely any Fijian escapes the disease; in fact, the native belief "that unless a child contracts yaws it will grow up weakly and unfit to withstand other diseases," is put into practice by a diligent attention on the part of the mother, that during the first two years of the Fijian infant's life he shall be inoculated with the disease. The native mother regards coko (or Fijian yaws) as a "crisis," like teething, to be passed through before her child can attain robust health.

However it arises, it is capable of communication by inoculation through contact between healthy and infected persons, the most common time for it to appear being between six months and two years of age; the probably commonest source of infection being from flies which have fed on yaws, or actual contact with a yaws sore.

There is a short prodromal stage—of uncertain duration, but believed to be about three weeks or a month—of wasting and fever, with a pinched cachectic appearance; in older subjects, wandering bone pains, especially at night, are complained of. In the more robust or healthy children a few largish isolated sores appear, in some cases only one or two, of a circular character and papular, half-an-inch in circumference. Pushing itself through the skin, if carefully examined, a vesicular bleb will be seen on the top of the sore; but the development of this, when once it appears, is by the rapid piling up of epithelium, so that often its vesicular character is not noticed, and when the sore is first seen it is a fungating granuloma, with hard indurated edge and base, exactly like a mulberry or raspberry. Where the sore encroaches on mucous membrane it becomes of a condylomatous character, in no way differing from an ordinary syphilitic condyloma.

² The article on "Coko" being mainly from the pen of our C. Med. Officer, Dr. Corney, a most accurate observer, but somewhat diffident in the expression of opinion.

This Report was originally written some months ago and for another purpose, when the author was in ignorance of the existence of the Yaws Committee of the Polyclinic.

¹ See Manson's "Tropical Diseases."

Condylomatous patches invade the mouth, lining the fauces and palate and around the anus and anal margins.

In the more severe cases, each isolated granuloma is the starting point, or "mother yaw," of a crop of vesicular papules, which surround it. There is here circular grouping and in their turn coalesce into a large mass covered with thick yellow scales very like an ecthymatous sore, which, when the scales are removed, can be seen exuding some purulent secretion, in the centre of a slight depression, the remaining ulcer being punched out.

If the sore is not irritated it dries up in the middle, whilst extending at the periphery, until in severe cases very large areas of skin are involved, and according to its extent and severity much or little contraction of the true skin occurs, producing hideous deformities and contractions. Partial closure of mouth, anus, nose and eyes is not very uncommon, whilst contractions of extremities, cicatricial bands in the vagina, frequently come under notice. A more general type of this stage of the disease, however—in young, badly fed, dirty Fijian infants—is the development in successive crops of, first, minute roseola papules, soon becoming vesicles, and later on, if neglected, coalescing into the larger granulomata spoken of above.

It is rare, however, for these cases to proceed to the full development of what I consider a late secondary manifestation. In most instances, in the badly fed marasmic Fijian children who suffer with the early diffuse vesicular eruption, chronic diarrhoea supervenes, becoming rapidly of a dysenteric character and ending shortly in death.

This is the usual history of early and severe yaws in young children under 2 years of age; the vital statistics of Fiji showing that the cause of the rapid decrease in the islands is due to loss of life under that age, and from dysentery, the primary cause in most cases being yaws. In isolated granulomatous yaws the prognosis is good if the patients be well cared for, but diffuse vesicular yaws in very young and badly fed infants is exceedingly fatal.

Assuming that the child survives such an acute attack, he lapses into an anæmic weakly state, the vesicles disappearing or coalescing, leaving pigmented scars, contractions and deformities, according to the extent and severity of the cutaneous eruptions, and which pigmentation may take any time from six months to years to disappear. The yaws eruption also appears on the head. Although the hair does not fall out as one sees in syphilis, at the seat of the eruption there is destruction of hair follicles even in Fijians, and in coolies suffering from yaws I have noticed a more general alopecia corresponding with the secondary yaws eruption.

The primary sore of syphilis may be represented in these early yaws cases by the "mother yaw," but whether the mother yaw is the primary seat of the inoculation I have no means of judging, as when the patient is seen he is generally covered with the eruption.

Eruptive sore-throat such as seen in early secondary syphilis is not noticed and may not exist, but the inside of the mouth and palate are studded with mucous patches of a condylomatous character. General

chronic adenitis is always present in young Fijians, non-suppurative and shotty, especially of cervical glands, and this quite independently of filariasis, which is of course very common in the group. If the child survives this stage a period of quiescence supervenes, during which he puts on flesh, becomes strong and sturdy, and to all appearances has shaken off the disease. This period lasts until the child is 8 or 9 years old, when, according to the circumstances of his life or surroundings, there appears what I call the late second stage of the disease, and which may occur from that age onwards to 30 or 35 years.

The clinical features of this stage are the development of circular punched-out ulcers, which may appear anywhere, but are very common about the legs; they have hard indolent edges with weak granulations in the centre; the ulcer spreads at the periphery and if neglected involves large areas.

The general health becomes again affected, the patient rapidly becoming anæmic with a pallid earthy hue about him, and he easily becomes a prey to inter-current disease, especially dysentery; periosteal nodes are common at this stage affecting the bones, especially of legs, ribs, forearms, face and forehead. These can be in no way distinguished from syphilitic nodes.

In severe cases, the whole shaft of a long bone becomes the seat of chronic periostitis, producing deformities so common amongst Fijians as to have received a nickname for such sufferers, *e.g.*, "*A tamata sele van*," from the deformity of the patient resembling the curved convex edge of a sword or cutlass, and also in outline resembling their native weapon, "the club."

The pathology of this yaws periostitis affecting the whole shaft of long bones, I had many opportunities of observing whilst Medical Superintendent of the Colonial Hospital. On my first acquaintance with these cases I considered them necrosis of the shaft with sequestra, although the extent of the disease and its chronicity were not quite consistent.

The general symptoms also were not those of acute necrosis, but resembled chronic syphilitic periostitis, of a diffuse character, dull aching pain, especially at night, chronic congestion of the soft parts of the limb, and in some instances ulceration of them, the patient being otherwise in fair general health and only occasionally suffering from a temperature.

In several cases I performed osteotomy, suspecting that a sequestrum was present, only to find a thick piling up of the periosteum, with a healthy bony shaft beneath. In fact, these are not cases of necrosis at all, but a chronic periostitis which does not seem to cut off the blood supply to the shaft. Another form of late second yaws appearing at this stage is serpiginous ulceration of the mucous membranes, what the natives call "*ka-ni-loma*," literally "eating away of the inside." These cases afford most typical clinical instances of the late secondary and tertiary ulcerations which we see in Europeans from syphilis.

This "*ka-ni-loma*" if neglected produces shock-ing ulceration, invading the nose, throat, larynx, and air passages, causing great destruction of tissue and cicatricial contraction and many deaths annually from asphyxia, due to this cause. Less severe cases of the yaws cachexia at this stage are attended by deep

ulcerations on the body and extremities, rhagides of the hands and feet—palmar and plantar psoriasis—or on the soles of the feet. "*Soki*" is a granuloma pushing its way through the hardened skin and becoming sometimes extremely painful.

During the child-bearing period amongst Fijian women, miscarriage and abortion are almost the rule, and although there are many other causes predisposing to both in their life and customs, investigation in hundreds of these—every miscarriage being the subject of a judicial governmental enquiry—has led me to think that secondary yaws affections of the decidua is the principal one.

The disease of yaws as it affects Indians and Europeans is in no way distinguishable from syphilis, having, however, in these races a more lasting debility and cachexia than amongst Fijians, the pigmentation of eruptions also being most severe and persistent. The primary yaws-sore in Coolies appears mostly on the genitals, with a general chronic adenitis especially of the groin and neck. Cutaneous eruptions and ulcers, especially in the cervical neck glands and groins, are, however, not so noticeable in these races living in Fiji as amongst the Fijians themselves, the tendency being to early periostitis of bones and extensive serpiginous ulceration of soft palate, skull, nose, &c.—in fact a more rapid inclination to the tertiary manifestation of syphilis.

The tertiary affections, noticed amongst Fijians by me, have been gummatous masses in the cutaneous and subcutaneous tissue, breaking down into large excavating ulcers, extensive ulcerations of throat and nose and of all bones, especially those of the nose, forehead and cranium. Nerve affections and ascending forms of neuritis of the cord have been also noticed by me amongst Fijians, explicable only on a tertiary implication of nerve centres by the yaws poison, for other causes of nerve breakdown are by virtue of their environment and *dulce far niente* life and the absence of nerve poisons, such as alcohol, to be excluded in a consideration of such cases. Secondary affections of the eye resembling those of secondary syphilis are not very noticeable, though many of the corneal opacities—so extremely prevalent amongst the race—might well owe their origin to yaws.

It is a most remarkable fact that I have never heard of any medical man in Fiji having seen, nor have I myself ever seen a case of hard chancre in a Fijian. My assumption is that the Fijian is protected by being already syphilised by yaws, for Fijians as a race I should say are very immoral, and have ample opportunities of contracting primary syphilis were they susceptible.

As it is, true gonorrhœa is very fairly common in Fijians at the ports of entry in the colony and to a less extent in the country. One would of course expect to find in newly born and growing Fijian children almost universal evidence of hereditary syphilis. I have of course seen such cases, but they are the exception. It may be that most of the severely syphilised children are still-born—causing the very large still-born mortality noticed in the Islands.

Typical cases of hereditary syphilis, however, are occasionally seen showing Hutchinson's teeth, Parrot's

nodes, &c., &c. I have often delivered Fijian women of children, who during the first week showed eruptions on nates and general bullous eruptions, such as if seen in a newly born European would have been pronounced syphilitic; nearly all such cases amongst Fijians die within the first week. "Snuffling" in new born Fijian children is almost the rule, which might owe its origin to either syphilis or to other causes. I have never been able to obtain a true history of previous syphilis in an Indian who subsequently became the subject of yaws, nor have I ever seen or heard of an Indian with yaws, nor of one who had ever suffered previously from yaws, contracting syphilis. Syphilis as we see it in Europeans is extremely common amongst Indian Coolies, and altogether I am of opinion that a previous attack of syphilis is protective against yaws, as yaws is protective against syphilis. It is a well known fact also that Fijian plantation labourmen frequently have sexual connection with Indian Coolie women, amongst whom syphilis is fairly common, and yet I have never seen or heard of a primary sore in a Fijian man. Further, this disease of yaws is peculiarly benefited by either mercury or iodide of potassium, noticeably the latter; the most severe cases rapidly yielding to large doses of it.

In the early stages the application of ung. hydrarg. nit. mit. locally to the yaws granuloma or sore, or calomel to the condylomata, with internally mercury combined with iodide of potassium, or the latter alone mitigates the disease, removes the cachexia, and rapidly heals up the local lesions whether mild or severe.

In fact, the only way to keep the majority of Fijians in good health is to put them on a three months' course of the iodide (gr. x. to gr. xx. t.d.s.) periodically. This is so fully recognised by Government and the Fijians themselves, that annually large quantities are distributed to the natives, and often purchased by them independently at chemists', as the only means of healing long continued local lesions from yaws.

Mercury is not so frequently employed on account of the bad effects attending its indiscriminate use, and the comparative inefficaciousness of it as compared with potass. iodidi, a thing we should expect drawing an analogy between the treatment of early syphilitic lesions—which Fijians are free from—and the late secondary syphilitic manifestations—which Fijians are very prone to.

Tubercular affections are uncommon in Fijians, especially tubercle of the lung, also pulpy disease of synovial membranes is very uncommon.

My conclusions on Fijian yaws are:—

Firstly.—The disease is a chronic and continuous one, and the subsequent phenomena seen in Fijians during adult and old life are sequelæ of the early infantile yaws that the race suffers from.

Secondly.—The early infantile and late adult eruptions are polymorphous and symmetrical, presenting in early life more commonly vesicular, papular, and pustular forms, whilst in later life the tendency is to scaly, isolated, papular ones, psoriasis, rupial and ecchymatous sores, tubercular and lupoid forms of ulceration.

Thirdly.—All Fijian yaws eruptions become of a

raw ham-like appearance, leaving a well marked pigmented discoloration, well seen even in the darkest types of natives.

Fourthly.—No primary yaws sore corresponding to a hard chancre can be found unless the mother yaws sore can be said to be one.

Fifthly.—There is a general chronic adenitis in all Fijians of a shotty character. This is also noticed in Indian Coolies and Europeans suffering from yaws. It is an adenitis quite distinct from that produced from filariasis, the latter a disease very common on the islands.

Sixthly.—The early bone pains and cachexia are similar to those noticed in early syphilis in Europeans.

Seventhly.—The later secondary yaws troubles such as periosteal nodes, skin eruptions, ulcerations of skin, superficial and deep nodular masses on the skin and deeper parts eventually breaking down into punched-out ulcers, ulceration of soft palate, mouth, tongue and bones, with induration, with many later nervous phenomena pointing to gummatous infiltration are all indistinguishable from the later manifestations of syphilis.

Eighthly.—Eye troubles of cornea, iris and deeper structures are common amongst Fijians, but whether due to yaws poison I am not prepared to say, but think it extremely probable.

Ninthly.—Early abortion and miscarriage are the rule amongst Fijian women, most often inexplicable after very strict enquiry as to other causes than a yaws taint of the decidua.

Tenthly.—Typical cases of hereditary (yaws) syphilis are occasionally seen in Fijians, though they are uncommon, and I explain this by saying that severely syphilised (yaws) Fijian women abort or badly syphilised (yaws) born children die early, masking the symptoms of hereditary taint, and healthier children survive without marked symptoms of heredity, only to develop later the second symptoms. The disease of yaws is common in Tonga, Samoa, Rotamah, The Levu Islands, The Solomons, and The New Guinea Groups. In the different races it shows modified characters, no doubt caused by environment, habits, customs and diet, *e.g.*, the Fijian lives principally upon yams, taro, fish and bananas.

There is no doubt but that if, after investigation, a definite pronouncement on the disease were arrived at, immediate measures would be taken to mitigate or stamp it out.

Crown Colony Governors are peculiarly disinclined to accept theories only as to disease, and in the absence of a definite consensus of opinion, important sanitary reforms are not carried out. It is therefore not difficult to see how often then, perhaps, our profession is responsible for want of legislation in public health matters, owing to an unanimous decision on disease not being arrived at. I have, therefore, had less hesitation in introducing for your renewed consideration the subject of yaws, more especially as now holding an executive appointment in Fiji, I am especially concerned in the administrative affairs of the native Fijians. Some further light may, I trust, be thrown by your Committee on this interesting disease and the means of at least mitigating it.

Besides being of local interest to me and others, the subject of yaws should be, and will tend to be in the future, a matter of serious attention by administrators and public men with regard to the prosperity of our Crown Colonies and the Indian Empire. As you are aware in the West Indies in the past, and particularly in Fiji at present, our prosperity depends upon the output of sugar, the most important industry in that Colony, and which is carried on by the annual importation of East Indian labour to the various sugar estates.

Already serious representations have been made to Fiji, and I doubt not also to the West Indian Colonies—who largely thrive by imported Coolies—by the Indian Government as to the occurrence of yaws in returned East Indians and the spread of the disease in British India, and as the Indian Government are most stringent in their regulations as to the individual health of their emigrants during the whole period of their residence and indenture in the islands, they will presently insist on active measures being taken to stamp out the disease in our Crown Colonies, or at any rate prevent the acquiring of the disease by Coolie labourers. If there is reason to believe that the diseases Yaws and Syphilis are analogous, and if that opinion is backed up by scientific medical authority, such as your Committee, the weight of your views would be such that no legislation would be deemed too stringent, or be hailed with more satisfaction by Administrators of Colonies as enabling them to act.

In these days when Malaria Commissions are sent out to investigate this form of tropical disease, and the Colonial Office and our Secretary of State for the Colonies is so actively solicitous for the health of our colonial servants and others, is it too much to ask that similar attention should be given to the investigation of yaws and other diseases. It is only by so doing that our present policy of Imperial Expansion can be carried on with success.

THE MALARIAL OUTBREAK IN THE PUNJAB LAST AUTUMN (September and October, 1900).—A leading article in the *Ind. Med. Gaz.*, March, 1901, discusses the cause of the high death-rate which prevailed in the Punjab last autumn. During these months in several districts the death-rate rose to over 150 per thousand, and in two the mortality amounted to no less than 200 per thousand. The high mortality followed closely upon an abnormally heavy rainfall. The experience of 1900 was but a repetition of what occurred during 1890 and 1892, and the association of excessive rainfall, with malaria, has served as a basis for some persons to throw doubt on the mosquito-malaria theory. It should be noted, however, that the fever outbreaks invariably occur *after* the rainfall, when the country is studded with pools and puddles, left by the subsidence of the floods; in these the mosquitoes find ready breeding places; and the fact of these being multiplied indefinitely during the wet seasons helps rather than detracts from the likelihood of malaria being spread by mosquitoes.

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THE

Journal of Tropical Medicine

APRIL 15, 1901.

PESTIS AMBULANS, PESTIS MINOR AND GLANDULAR FEVER.

THERE exists considerable confusion concerning the terms *pestis ambulans* and *pestis minor*, the tendency being to consider them as synonyms for a single affection. With this acceptance we beg to differ, and to point out that in the use of the terms we may possibly be dealing with diseases belonging to the same genus, but in all probability specifically differentiated. *Pestis ambulans* ought to be considered as a mild variety of true plague and the term restricted to that condition, just as in typhoid fever mild cases are referred to the same category. *Pestis minor*, on the other hand, would appear to be a fairly well-defined ailment. As so often pointed out by many observers, it is a disease which may precede, run concurrently with, or continue after, an outbreak of true plague, or it may, on the other hand,

occur independently of an epidemic of true plague.

Cases of what must be regarded as *pestis minor* have been notified by Payne, Goddard, Cantlie, Begg, Simpson and other writers; and the several descriptions of the course of the disease tally so accurately that it would appear that a definite ailment was observed independently by these authorities. The one factor wanting, up to the present moment, that the disease dealt with was caused by a bacillus in any way allied to the bacillus of true plague has been the absence of bacteriological tests. The absence of such proof must not, however, blind us to the possibility of such an alliance. The statement of a case in point may bear this out. A boy, aged 16, dwelling in the heart of one of the largest cities of Western Europe, was taken ill with pains in the limbs, especially the lower extremities, some vomiting, fever, a tender area in right groin, and he became somewhat delirious. He was admitted to a general hospital, and there, after a week, the glands in the groins, iliac fossæ, arm-pits and neck became enlarged to about the dimensions of small beans. The tongue was thickly coated, and the stools became loose, somewhat pea-soupy in appearance and with a considerable quantity of mucus in the motion. The boy's previous history showed he had been operated upon previously for an empyema in the left chest. His mother, a widow, lived in one room with her five children, so that the hygienic environment of the patient previous to admission to hospital may be imagined.

Suspicion of the case, being possibly plague, having arisen, the patient was examined on the fifteenth day after admission to hospital by a medical man familiar with plague, who refused to come to a conclusion on the clinical evidence alone. A small quantity of the blood, &c., from the swelling in the right groin was submitted to an eminent bacteriologist who failed to find the bacillus in stained specimens examined by the microscope. A cultivation gave at the end of twenty-four hours negative results, but after sixty hours the cultivation appeared typical of plague, but a guinea-pig inoculated with the cultivation gave negative results. The cultivated

bacilli were, however, of the involuted form. The boy, after eighteen days in hospital, was removed to an isolation hospital where he speedily improved and got well. This case is of extreme interest. The chief points to be noted are: (1) no case of plague was known to exist in the city, or even in the country in which this boy lived; (2) he had no contact with sailors or with shipping; (3) no other person in the house has had a similar ailment; (4) the only known variety of true plague to which the patient's symptoms could be referred were to those of the septicæmic form of plague; but the boy recovered from what after all was a mild illness, and septicæmic plague is never mild; (5) the microscopic and bacteriological examination and tests seem to indicate not only that the bacilli were few in numbers, but also modified in their anatomical character and not virulent in their toxic power. In our opinion this was a case of true *pestis minor* with a bacillus allied to that of true plague. But many other considerations arise from the careful study of this case: amongst the most notable would seem to be the fact that plague may exist in a sporadic form and remain unrecognised.

The term sporadic, perhaps, hardly conveys the complete isolation of such a case, for plague was not known to exist at the time in any part of Western Europe. What are we to infer from this and other cases which have occurred? The conclusion seems obvious, namely, that in Europe at the present moment sporadic cases of *pestis minor* are occurring which are unrecognised and excite no suspicion of their true nature. We have become familiar with the term "glandular fever" of late years, and it is possible that the illnesses of many children with febrile symptoms and general adenitis are being grouped under this head, which, were they as carefully tested as the boy referred to in this article, would exhibit bacteriological indications justifying their being placed in the plague category as *pestis minor*.

PINTA OR LEUCODERMIA?

REMARKS APROPOS OF THE INTERESTING CASE WITH PHOTOGRAPHS GIVEN BY DR. EDGAR IN THE JOURNAL OF FEBRUARY 15, 1901.

By W. J. BUCHANAN, M.B., Major, I.M.S.
Bhagalpur, Bengal.

ONE is not quite satisfied that the case is one of pinta. Judging from the photographs and the description the case has not been established. In Dr. Edgar's case the patches appear to have only been of one colour, viz., white, with increase of the natural black pigment around the white spots. There is no mention of the presence of any other coloured patches, red and blue, which are characteristic of the disease. There was little or no desquamation, nor were the patches itchy. Moreover, according to Brault (p. 282), the white variety of pinta is always associated with patches of other colours.

Is it absolutely certain that the case was not one of extensive leucoderma, which is very common in India (Allbutt, vol. viii., p. 706)? Dr. Edgar's patient was a native of Madras, where the disease is unknown, but this does, of course, not exclude the possibility of her having acquired the disease while resident in Perak.

Cases of leucoderma, quite as advanced as the photographs of Dr. Edgar's case, are by no means uncommon in India. Good examples of a not dissimilar extension of leucoderma were given in the JOURNAL OF TROPICAL MEDICINE by Dr. F. Pearse, in July, 1900 (p. 294).

The information given as to the presence of mycelial filaments is not very conclusive.

Before accepting this increased area of distribution for pinta, a new-world disease, it is necessary to have a more unequivocal case than this one.

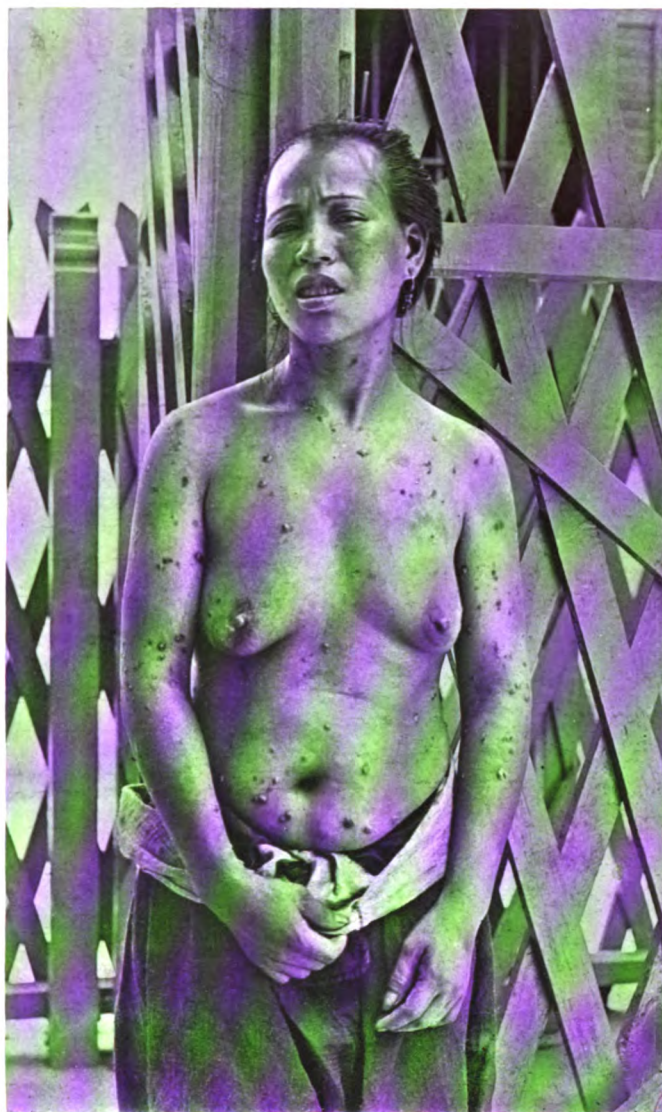
MEASLES IN THE TROPICS.

By M. D. EDER, B.Sc.Lond., M.R.C.S., L.R.C.P.
Palmira, Colombia.

IN connection with the reports you have published as to the occurrence of the exanthemata in the tropics, it may be of interest to record an epidemic of measles in this district. The first cases were observed in December, 1900. The disease was probably introduced by soldiers returning from the coast. My cases followed the text-books' descriptions.

Palmira is in latitude 3°33' N., longitude 77°59' W.; 954 metres above sea level. Mean temperature 24° C. Variation in temperature slight.

MR. KENNETH W. GOADBY, M.R.C.S., L.R.C.P., L.D.S., and Mr. James Warburton Brown, M.R.C.S., L.R.C.P., L.D.S., have been appointed Dental Surgeons to the Seamen's Hospital Society. Mr. Goadby is attached for duty to the Royal Albert Dock Branch of the Society's Hospital (to which is attached the London School of Tropical Medicine), and Mr. Warburton Brown will attend at the "Dreadnought" Hospital, Greenwich.



YAWS.

From a photograph by Dr. P. S. COUSLAND, Swatow, China.

Photograph of a Chinese woman, native of Chao-Chow-Foo. Her husband returned from the Straits Settlements suffering from Yaws; he communicated the disease to his wife and to his son aged 6. This is the only instance of Yaws met with by Dr. Cousland in China. Anti-syphilitic remedies proved inefficacious.



THE CONDITION OF THE TEETH IN NATIVES OF THE TROPICS.

AN editorial in the issue of February 15, 1901, of this Journal, in which Mr. Cantlie asked for information, has brought from Major W. J. Buchanan, I.M.S., a reply in the form of a reprint from the *Indian Medical Gazette* of September, 1899. Although Major Buchanan mainly deals with the question as to whether the stumpy teeth and ulcerated gums so frequently seen in the native prisoners in Indian jails is scorbutic or not, there is much to be learned in the condition of the teeth of the natives in general. Major Buchanan made a careful examination of the teeth of 500 men in good health and on hard labour in the Central Jail, Bhagalpur. The results of these are given in Tables I. and II.

TABLE I.

	Condition found	HEALTHY MEN.		SICK AND SICKLY
		Upper Jaw. Per cent. 500 men.	Lower Jaw. Per cent. 500 men.	Upper and Lower Jaws. Per cent. 50 men.
1	Retraction of gums (one or more teeth)	9 p.c.	70	75
2	One or more teeth fallen out	7 "	13	14
3	One or more loose teeth	4 "	11	8
4	Pus exuded on pressure	2 "	12	14
5	Irregular rows of teeth	11 "	21	10
6	Blue-black pigment, slight	40 "	35	38
7	" " " " deep	7 "	21	17
8	Gum thickened but firm, not spongy	14 "	24	10
9	Thin bright red line around base of teeth	3 "	8	10
10	Copious deposit of tartar	10 "	18	16
11	Slight deposit of tartar	20 "	66	75
12	Gums swollen or spongy	1 "	8	9
13	Bright red, but firm healthy gums	1 "	4	..
14	Blackened teeth-rows	3 "	6	6
15	Genuinely clean and healthy gums	55 "	14	2
16	Ulcerated gums	Nil.	Nil.	Nil.

TABLE II.

Both upper and lower gums healthy	14 p.c.
Both gums equally bad	1 "
Upper worse than lower	2 "
Tongue, red and raw patches	5 "
Tongue pigmented	14 "
Aphthous spots on gums	3 "
Gum-boils	1 "
Decaying teeth	5 "
Buccal membrane pigmented	11 "

"It will be seen from the above table, that even healthy men fit for, and working at, hard labour have very far from sound and healthy teeth. That the state of their teeth would be even worse I believe, but that nearly a year ago I ordered the use of tooth-sticks and gave orders for the jailers to encourage their use. The most remarkable fact, however, is the very great contrast between the upper and lower jaws. Nearly every bad condition noted is found much worse and much more commonly in the lower jaws. In only 14 per cent., out of over 500 men examined, could I record that the gums and teeth of both jaws were in

a sound and healthy condition: but 55 per cent. of them had upper gums which were sound, firm and healthy. This, I think, is not difficult to account for, and helps us to an explanation of the condition. Decomposing food or any other local cause acting on the teeth would naturally most affect the lower teeth, on account of the lower lip and floor of mouth acting as a sort of retaining bag for the acrid foreign accretions or secretions. The large percentage of retracted gums in the lower jaw includes all cases, whether one only or many teeth were exposed. In nearly all cases, only the front teeth are affected, and chiefly the lateral incisors and canines. The retraction of the gums in many cases was slight, but in others very advanced. As regards loose or fallen teeth, this may be attributed in some cases to the abuse of mercury by *baidis*, and such class of practitioners, though it is not easy to get a definite history of such from prisoners. Another fertile cause of loose teeth and toothless gums is the long-continued use of lime with the *pan*. The betel-nut mixture so much used by Indians is, I have no doubt, useful as an aid to the digestion of bulky meals of rice, but we have the authority of Norman Chevers that the use of lime with the *pan* is bad, because especially where tooth-cleaning is neglected, the lime forms an incrustation between tooth and gum and ultimately lifts the tooth out of its socket. In the above table there are no cases of ulcerated gums, which I well remember as common in the autumn of 1894. Pus exuded on firm pressure on the gums in only a few cases, and mostly in connection with one or two teeth only. This is the condition Major A. Buchanan has called special attention to under the name *pyorrhæa alveolaris*. Talbot, of Chicago, has shown in his book on "Degeneracy," that, of over 1,500 criminals examined at the Elmira and Pontiac Reformatories in America, no less than 40 per cent. had irregular lines of teeth, and he looks upon this as one of the stigmata of degeneracy. I believe that the vast majority of the bad gum cases in jail are due to local causes, *i.e.*, neglect of the teeth. In healthy, non-malarious years, if the teeth are neglected, little or no bad effect will be produced upon the general health; but if malarial fevers or diarrhoea or dyspepsia prevail, a very large number of the prisoners who thus suffer will show very unhealthy, swollen and even ulcerated gums. This may be due to want of assimilation of the food, especially when the fever has been of the form common in jails and known as "night fever," which is often neglected by careless prisoners or ignorant medical subordinates. It is possible, moreover, that a casual observer seeing teeth and gums as described above in Table I. in these 500 sleek and healthy prisoners of Bhagalpur Jail, might suspect a scorbutic taint, but this I have endeavoured to show would be a misunderstanding of the cases."

PLAGUE IN CAPE TOWN.—Up to April 14, 392 cases of plague had occurred in Cape Town since the commencement of the outbreak; of this number 152 cases proved fatal.

Reviews.

WEITERES ÜBER MALARIA IMMUNITÄT UND LATENZ-PERIODE. (Further observations concerning the immunity and latent period of malaria.) By Dr. Albert Plehn, Government Medical Officer, Kamerun, West Africa. Gustav Fischer, Jena, 1901, with three plates, pp. 81.

This work is replete with interest, and is compiled after extensive observations, carried on with that care and scientific precision which characterises all Dr. Albert Plehn's researches. Dr. Plehn does not agree with R. Koch's enunciation that negroes on the African coasts are naturally immune against malaria, but he comes to the conclusion that a relative immunity plays an important part in both natives and Europeans. By a *relative* immunity, Plehn understands one in which a virulent and persistent exposure to malarial infection is alone capable of producing the disease, and even when infection does take place the course of the fever is practically abortive.

By *absolute* immunity he understands a condition in which, although the malarial parasite is met with in the blood, the usual symptoms of the disease are in complete abeyance. He, however, considers that although febrile symptoms are not present, that the *anæmia* of the negro is in all probability due to the malarial infection. In other words, Plehn would seem to regard the so-called immunised state of the negro to correspond to what is termed the post-malarial state in Europeans who have dwelt for a time in the tropics.

The conclusions Dr. Plehn arrived at as the results of his investigations are: (1) There is a "relative immunity" against malaria in most of the natives of the equatorial West African coastal regions. (2) There is also an "absolute immunity" against the injurious effects of the malarial parasites in many natives. In those who possess this immunity the parasites may be met with years after the last incidental infection without causing any illness. (3) By means of the systematic use of quinine, a relative immunity may in time be achieved in European colonists. (4) The total of those relatively immunised amounts to a half of those observed, and the number of cases of severe illnesses is less than a quarter. In those cases in which quinine has been regularly taken since arrival in the fever centre, these results are still more favourable. Severe, dangerous illnesses and complications, especially hæmoglobinuria, are of extremely rare occurrence when the prophylaxis has been systematically followed. No fatal cases occurred. (5) In persons thus immunised, the malarial parasite—as in the native—is occasionally present without causing fever. (6) With the exception of those who possess natural or artificial immunity, the malarial plasmodia are never present forty-eight hours without causing the characteristic symptoms of fever. (7) In the European colonists, *bisophile* bodies of various sizes and forms are found in the red blood corpuscles before the initial attack of fever. They are likewise present in the natives during the afebrile intervals, and are less frequent during the attack of fever. Their first appearance proves that infection has taken place,

their presence that it is continued; their disappearance that the infection is extinguished. They stand in near relationship to the latent forms of the malarial parasites; certain types, indeed, correspond to these latent forms. (8) The variation of the number of infected blood cells, and the size of each body has no direct bearing on the severity and frequency of the previous malarial fevers nor on the degree of the accompanying *anæmia*. The systematic use of quinine exercises a powerful check on the development of the germs and the accompanying *anæmia*.

This book is of high scientific value, and its careful perusal will amply repay any one interested in tropical medicine.

New Drugs.

IZAL.—This disinfectant is rapidly gaining in public favour. The scientific tests to which its powers have been subjected seem to have been thorough, and clinical experience fully bears out the results obtained in the laboratory. "Medical Izal," as the refined preparation of Izal is termed, has the advantage—the immensive advantage—of being non-poisonous and non-corrosive. Medical Izal is an emulsion, containing 40 per cent. of pure Izal oil. The preparation is a coal (not coal tar) product, and consists of oxidised hydrocarbons containing a greater proportion of hydrogen to carbon than the recorded members of the phenol series, and a less proportion than the members of the alcohol series. In surgery we can, from practical experience, strongly recommend Izal as a pleasant and efficient disinfectant and antiseptic. It does not injure the surgeon's hands, whilst at the same time it bestows efficient asepticism; wounds are not irritated by its use; and lastly, but by no means amongst the least of its benefits, no damage is done to surgical instruments when they are immersed in it. The literature which the proprietors circulate with their advertisements is of a genuine character, so far as we have seen. Professors Klein and Delépine furnish bacteriological reports of the efficiency of Izal which cannot be gainsaid.

In another part of this issue we have drawn attention to the efficiency of Izal in dysentery; and elsewhere its beneficial action in typhoid has been remarked upon.

The manufacturers exhibit Izal in many preparations in addition to those we are accustomed to see in the operating theatre. Cuxson, Gerard and Co., of Oldbury, have prepared Izal Lint, Wool and Gauze; Newton, Chambers and Co., Thorncliffe, Sheffield, have prepared Izal Perles, Lozenges, Ointment, Cream and Soap.

It is evident that the proprietors have discovered an efficient germicide, an agreeable disinfectant and an antiseptic of high practical value. To readers of this Journal the fact that Izal possesses a highly beneficial and curative action in dysentery is a matter of consequence. It must be remembered, however, that dysentery being merely a comprehensive term for several possibly distinct diseases, rather than a specific

ailment, this preparation must rather be regarded as a potent agent for good in all cases of intestinal flux, irrespective of origin.

ANIDOL is an antiseptic, and is said to be a solution of trimethanol. A 1 per cent solution is used as a bactericide, and in the proportion of 1 in 5,000 it serves well for the sterilisation of instruments. BASOL is also a new antiseptic, which is said to contain 50 per cent. of cresol.

Current Literature.

BLACKWATER FEVER.

NOTES ON BLACKWATER FEVER IN SOUTHERN NIGERIA.

By W. S. THOMPSTONE, F.R.C.S. Edin.,
and

R. A. BENNETT, M.B. Lond.

Government Medical Service, Southern Nigeria.

ACCORDING to the older residents in this part of the West Coast of Africa, blackwater fever appeared first in 1886; but it is extremely probable, from descriptions of cases, that it occurred occasionally many years before that date, and was diagnosed as "yellow fever" or "bilious remittent with jaundice." There seems to be no doubt, however, that the disease is much more frequently met with nowadays than formerly, and that it varies very much in severity in different years. In one season a dozen cases will occur consecutively without a death, and in another the death-rate may be as high as 20 or 40 per cent. of the cases treated.

Its ætiology is unknown, though the fact that the majority of cases occur between the second and fifth years of residence, and usually in those who have suffered from many attacks of malarial fever in the past and are in consequence more or less anæmic, has led to the theory that it is of malarial origin. It must still remain, however, an open question whether the disease is to be regarded as a direct consequence of hæmamoebiasis or not. We have met with several cases in patients who have taken very little quinine, and since extracts from Koch's communication have been published in the lay papers, many people have been frightened out of using the drug as a prophylactic altogether, without any diminution in the number of cases of blackwater fever.

In the great majority of cases there is no history which throws any light on the predisposing cause, though exposure, in a certain number of cases, appears to have been the exciting cause of the attack. Although it is true that the majority of cases occur in patients who have lived from two to five years on the coast, nothing really definite can be said on this point, and there is apparently no question of individual immunity. Thus, cases have been met with of newcomers contracting the disease after only a few months' residence, and on the other hand, of men who have lived for many years in the country, and have then suffered from the most dangerous and fatal type.

As far as we can judge from the statistics of Southern Nigeria, there is a well-marked connection between the particular season of the year and the number of cases of blackwater fever recorded. Curiously enough, this connection is in direct opposition to that which obtains in the German Cameroon Colony—the headquarters of which is distant but a few miles from Old Calabar. F. Plehn, in his monograph on the diseases of the Camaroons, distinctly states, that from the beginning of the rains in March, to their termination in November, the number of blackwater fever cases steadily grows, to fall suddenly at the onset of the dry season. Now the seasons in Southern Nigeria are practically the same as in Camaroons, and yet the cases of blackwater fever met with here are much more common in the dry season, and only an occasional case occurs in the rains.

There seems to be no doubt that the coloured races enjoy in the Protectorate the same immunity from blackwater fever that has been observed in other districts of the West Coast. Since the time when Government statistics were first instituted, no case has been recorded in a native.

It is impossible to judge of the part played by sex in the determination of the liability to this disease, the relatively small number of European women resident here, as well as the conditions under which they live, precluding the possibility of drawing any conclusion on this point.

Finally it may be stated with confidence that exposure, and alcoholic or other excesses, frequently pave the way to an attack, though even here no definite connection can be found between cause and effect.

Symptoms.—The disease is, as a rule, ushered in by a sharp rigor, which does not differ in any way from the ordinary ague fit. The patient may have been in perfect health up to the onset of the attack, though in a certain percentage of cases there is a history of one or two slight fevers immediately before the blackwater fever commences. He finds, on passing water, that his urine is the colour of porter, and at first usually scanty in amount. The temperature rises to 104° or 105° and then falls more or less rapidly, the skin and conjunctivæ become rapidly jaundiced, and vomiting of a most persistent and distressing character sets in. The general condition of the patient becomes rapidly more serious, and in a bad case, in twelve hours he can hardly lift his head from the pillow. The initial rigor may be followed by others during the first twelve hours, though in the majority of cases there is only one, followed by a sharp rise and gradual fall to about 101° or lower.

It is impossible to lay down any definite type of temperature curve; many cases fall to normal about the third day, and then a secondary rise takes place which lasts about a week. In another class of cases there is a tendency to hyperpyrexia which is often fatal, and in others there is a gradual fall from the first, the temperature reaching the normal point only as the patient is convalescent.

The urine generally clears up on or about the third day of the disease, often very rapidly, becoming free from hæmoglobin in six hours after it has commenced to get lighter in colour. It is of the same character

from the first rigor to the time when it begins to clear, being acid, 1016 to 1025, the colour of porter, with a brown froth, and there is deposited slowly on standing a copious brown sediment consisting of blood and granular casts, epithelium, granular debris, and a few red blood corpuscles. In amount it varies enormously, there being polyuria in a considerable number of cases, over 100 ozs being passed in the twenty-four hours in some instances, while in other cases the quantity becomes gradually smaller until suppression sets in and the patient succumbs. There is often a partial suppression on the second day, which is of no serious import. The act of micturition often causes intense pain during the first few hours in bad cases, and the first specimen may contain much pure blood.

The pulse becomes rapid and tense early in the disease, and the respirations shallow and frequent; the pulse-respiration ratio is altered, and instead of four to one may be three or even two to one in severe attacks, and an early distressing symptom is breathlessness.

The liver is normal in size as a rule.

The spleen, in most of the cases met with here, is enlarged, though whether, in a country where nearly everyone has suffered more or less from malaria, this can be taken into consideration as a symptom of blackwater fever, is open to doubt.

The mental condition is one of anxiety; and constant restlessness and insomnia, with the persistent vomiting, add greatly to the distress of the patient. The mind is usually clear, though late in the disease—in cases which are running an unfavourable course—the patient falls into a condition of low muttering delirium, out of which he appears to partially awake when spoken to.

In cases of suppression of urine, even when very prolonged, we have never seen either coma or convulsions, and in fatal cases death apparently occurs from exhaustion.

The general condition after the first three days is that of profound anæmia caused by severe hæmorrhage, and recovery is very slow.

The treatment which we have usually adopted has been as follows:—

A large dose of calomel is given at the commencement of the attack, followed in six or eight hours by a saline, repeated if necessary until free purgation occurs; the patient is then put on a mixture containing sod. salicyl. and sod. bicarb., taken every four hours. Free stimulation is resorted to early, as the strength rapidly fails. Frequent feeding is of the utmost importance, and if food cannot be retained by the stomach, rectal injections and suppositories should be used from the beginning. The vomiting may be combated by chloroform, acid. phosph. dil., sinapisms, and the usual methods, and the insomnia is best treated by bromides, though all attempts at treatment of these symptoms often fail. Digitalis and strychnine should be freely given if cardiac failure threatens; and if the patient recovers, he should be sent at once to a temperate climate.

We are strongly of opinion, after an experience of the treatment of this disease extending over a period of nearly eight years, that no one who has once

suffered from blackwater fever should ever be allowed to return to West Africa. Recurrence is the rule; and although an individual may survive many attacks, the disease invariably kills in the end.—*Scottish Med. and Surg. Journal*, April, 1901.

DYSENTERY.

THE SPECIFIC TREATMENT OF ACUTE DYSENTERY.—Dr. W. T. Cruikshank believes that in the treatment of dysentery by sulphate of magnesium we have a remedy which stands in as specific a category as the treatment of malaria by quinine. From the first onset of acute dysentery administer the following:—

R	Mag. Sulph.	..	..	..	3i.
	Acid Sulph. dil.	..	..	..	mx.
	Aquam Destil.	..	..	..	3i.
Every three hours.					

In a few hours beneficial results may be confidently expected, and in twenty-four to forty-eight hours a marked improvement may be looked for, the stools taking on a biliary appearance. The treatment is continued until the stools are well nigh normal. Three to six days is the average time required for the establishment of convalescence.—*New York Med. Journ.*, March 16, 1901.

IZAL IN THE TREATMENT OF DYSENTERY.—Every practitioner in the tropics will welcome any addition to the list of drugs whereby dysentery may be combated. The most recent of such drugs is Izal, which Mr. W. Watkins-Pitchford, M.B.Lond., F.R.C.S., serving with the No. 7 General Hospital (*See Brit. Med. Journ.*, November 10, 1900), found capable of ameliorating the symptoms of dysentery. Dr. Watkins-Pitchford states that he exhibited izal in the following formula:—

R	Izal	..	..	..	..	miii.
	Bismuthi Subnitrat	..	..	..	..	gr.x.
	Tinct. Chlorof. et Morph.	..	..	..	..	mviii.
	Mucilag. Acaciæ ad	..	..	..	..	3i.

One ounce to be taken every two, four, or eight hours, according to the severity of the symptoms.

It is asserted that this combination of drugs, in the few sporadic cases of dysentery which have arisen in the hospital, has in every instance "brought almost a rapid cure"; and even in well advanced cases of a severe type the results "have been equally gratifying."

STAINS FOR THE AMŒBÆ COLI.—Loeffler's methylene blue solution is the quickest and best stain for the amœbæ coli; the smears are exposed to the stain for five minutes, then washed in distilled water and mounted in canada balsam. The carboic fuchsin stain is best when it is desired to stain the nucleus or nucleolus of this amœbæ.—*Dr. C. F. Craig in Med. News*, March 16, 1901.

MALARIA.

RECOGNITION OF MALARIAL PARASITES.—According to G. Maurer there are only three forms of the plasmodium; their characters being differentiated as follows: (a) *Pernicious fever form*. Ring form of parasites are diagnostic of pernicious fever. When in addition crescents are present, and when in a second

examination a few hours subsequently nothing but rings and crescents are found the diagnosis is conclusive. (b) *Quartan fever form*. The parasites are larger, may or may not show rings, leaving the cell body intact. (c) *Tertian fever form*. The smaller size of the parasite and the granulation of the cell body characterise this form of the parasite.

Maurer states that when in two specimens of blood taken at intervals of a few hours no parasites are found the presence of malarial infection may be excluded. Stained specimens are more satisfactory than are fresh specimens in the diagnosis of malaria. —*Münchener Medicin, Wochenschrift*, February 19 and 26, 1901.

A MODIFICATION OF THE ROMANOWSKI-RUGE METHOD OF STAINING THE PLASMODIUM OF MALARIA AND OTHER PROTOZOA. By W. Hanna, M.B., R.U.I., D.P.H. Cantab.—The following account of a modification of Romanowski's method will be found in the *Russian Archives of Pathology, Clinical Medicine and Bacteriology*, vol. x. part 4, where Dr. N. Berestneff describes an exceedingly convenient and rapid method of staining malaria plasmodia. It has been used with great success in this laboratory, and deserves to be widely known in scientific institutions in England. The following is the method of preparation. A 1-per-cent. aqueous solution of methylene blue (med. puriss. Höchst) containing 0.3 per cent. of carbonate of soda, is heated for three hours on a water bath and filtered. One cubic centimetre of this solution is mixed with 1.5 cubic centimetres of a 1-per-cent. aqueous solution of methylene blue, and to this mixture are added five cubic centimetres of a 1-per-cent. aqueous solution of eosine (extra BA Höchst). Old preparations of semilunar bodies and halteridium Danielewskii ought to be stained in this mixture for from fifteen to twenty hours at laboratory temperature. For young forms it is sufficient to stain for from fifteen to twenty minutes without heat, followed by gentle heating for from fifteen to twenty minutes until steam rises. To decolourise the red cells, which are blue after this staining, the preparation is put for from two to five seconds in the following mixture:—Ten cubic centimetres of methylene blue, 1 per cent., 200 cubic centimetres of distilled water, and 0.25 cubic centimetre of acetic acid. The preparations are washed in water and dried with blotting paper, and they are then dipped for from five to twenty seconds in absolute alcohol to dissolve off any residual stain, and finally washed in water. Fresh preparations of blood containing plasmodia fixed with absolute alcohol are stained in this mixture diluted with from two to four volumes of water for five minutes without heat, followed by gentle heating for from five to ten minutes. Blood containing trypanosoma, and slides of the intestinal contents of guinea-pigs having trichomonas fixed with absolute alcohol or sublimate, are stained with this mixture undiluted or diluted with two volumes of water, as for plasmodia. The flagella are stained a violet-red, and it may be seen (in trypanosoma) that they have a nucleus; the same may be said regarding trichomonas. The chromatin of plasmodia and the other protozoa in question is stained by this method a bright red violet, the

protoplasm blue, the leucocytic nuclei and Bizzozero's plates like the chromatin of the protozoa, neutrophile granules are rose, eosinophilous cells are purple, whilst the red corpuscles are of a delicate rose colour. Dr. Berestneff working in Bombay has informed us that **he has slightly modified the above for tropical climates**. He adds the stains in the following order and well mixed:—Soda methylene blue 1 per cent. diluted with equal parts of water, 0.5 cubic centimetre; methylene blue 1 per cent. diluted with equal parts of water, 1.5 cubic centimetres; and eosine 1 in 2000, 5.0 cubic centimetres. He informs us that the best results are obtained with fresh preparations of halteridium and malaria by at once floating the dish containing the mixture and preparations for from five to ten minutes upon the surface of water raised to 55° C. The above method has been tried here with excellent results. —*The Lancet*, April 6, 1901.

"Mosquitoes in India," see p. 843, *British Medical Journal*, April 6, 1901.

THE SUPPRESSION OF MALARIA.—Dr. A. R. Waddell, in the *Journal of Balneology and Climatology*, January, 1901, contributes an able paper on this subject, in the course of which he remarks: "The hammer and chisel, then, for the rock hollows, the drain pipe covered with porous material up to the level of the impermeable, and smooth sides and uniform currents for the running streams.

"There must be no surface oozings, no places where aquatic weeds can grow, no pools, ponds, backwaters, overflowings or leakages, and only those running streams which maintain a certain velocity, and the sides of which are smooth and straight, can be permitted above ground. All others must be piped-in or covered over, and if the needs of man and his animals necessitate open water surfaces they must be netted round or kept under systematic inspection against larvæ. Lakes, too, must be properly banked and provision made against overflow; storm waters must be anticipated, as in our townships, and areas, waterlogged by the lowness of their levels, must be kept efficiently pumped clear.

"If, as I said before, these conditions are made permanent in any one district, anopheles, and with it malaria, will become extinct."

MALTA FEVER, INDIA.

In the *Ind. Med. Gaz.*, March, 1901, Lieut. E. O. W. Greig, M.B., I.M.S., describes three cases of Malta fever occurring amongst native soldiers who had been quartered for two years in the Swat Valley. The characteristics of the illness were chiefly (1) profuse sweating; (2) undulation of the temperature; (3) the futility of the administration of quinine; (4) severe pains in joints, which become swollen, red, and tender to the touch; (5) the spleen and liver were not enlarged; (6) the blood gave the reaction to Malta fever; (7) there were no malarial parasites in blood. Owing to the variable clinical phenomena which accompany this ailment diagnosis can only be confirmed by the serum sedimentation test. This test

appears to have been carefully applied by Lieut. Greig, and there seems no doubt that the cases he records are really Malta or undulant fever.

PLAGUE.

NOTES ON THE PLAGUE IN QUEENSLAND.—In an interesting article on the plague, published, in *The Australasian Medical Gazette* (January 25, 1901), Dr. A. Jefferis Turner, of Brisbane, remarks that "No observer can fail to be struck with the variability of the bacillus. One is apt to be misled by the bacilli commonly figured or exhibited, which are, naturally, taken from the most typical examples. In the same specimen all gradations may be observed from the most typically bipolar examples, staining only at the extreme ends and perfectly clear between, to specimens in which bipolarity is imperceptible. To establish the diagnosis distinctively, bipolar specimens must be searched for, and this is sometimes tedious work."

DENYING THE PRESENCE OF PLAGUE.—One of the most preposterous insinuations we are acquainted with is that accredited to the Governor of the State of California, who, in denying that plague exists in San Francisco, intimated in a recent message to the Legislature "that certain physicians, having cultures of plague bacilli in their possession, have, 'innocently or otherwise'—that is, ignorantly or criminally— inoculated the dead body of a Chinaman with them, and that the finding of the germs in such dead body has resulted in spreading a false alarm calculated to strengthen the hands of Dr. Kinyoun, the Federal Quarantine officer, and to induce the city of San Francisco to appropriate more money for its Board of Health." Can ignorance and prejudice go farther?

Letters, Communications, &c., have been received from:—

B.—Staff Surg. W. G. K. Barnes, R.N., H.M.S. "Undaunted;" Dr. R. Lee Bolton (Smyrna); Dr. S. Osborne Browne (Gold Coast); Major W. J. Buchanan, I.M.S. (Bhagalpur).

D.—Dr. A. B. Dalgetty (South Sylhet).

K.—Dr. Lim Boon Keng (Singapore).

M. Col. K. Macleod (Woolston); Major R. R. H. Moore, M.D., R.A.M.C. (Barrackpore); Dr. Frank C. Madden (Cairo).

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Medec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Climate.

Clinical Journal.
Clinical Review.
Giornale Medico del R. Esercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
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3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

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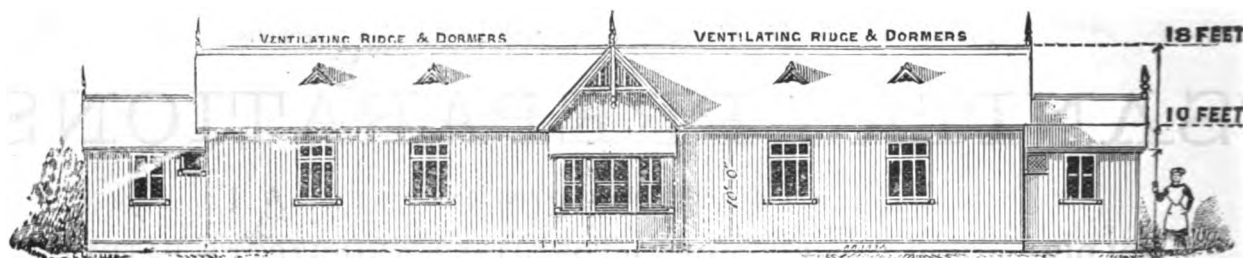
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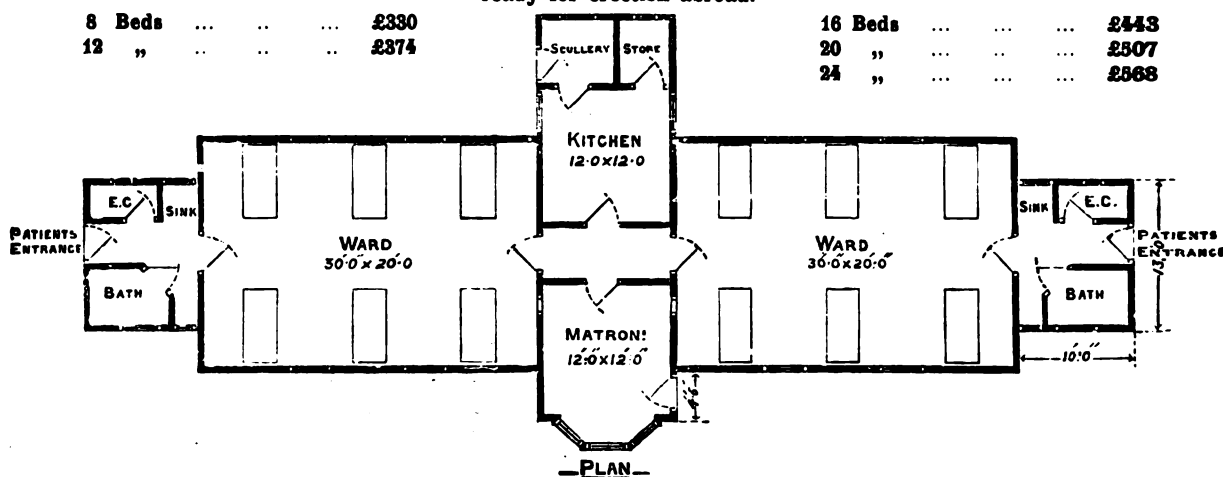


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"By WILFRED WATKINS-PITCHFORD, M.B., London, F.R.C.S., Eng., C.M.O. with No. 7 General Hospital, South Africa Field Force, Estcourt, Natal.

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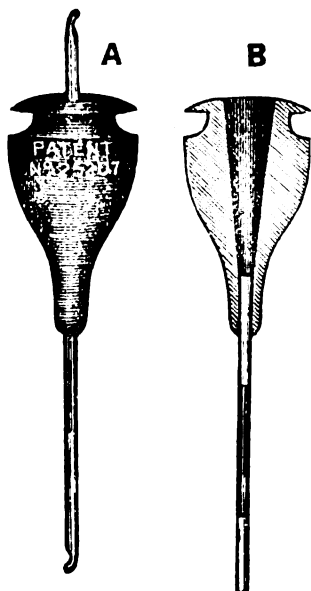
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The Journal of Tropical Medicine.

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Original Communications.

THE ETIOLOGY OF BÉRI-BÉRI.

By H. NOBLE JOYNT, M.A., M.D.
Government Medical Officer, Fiji.

I READ with much interest the letter of Dr. A. Van der Scheer in the issue of the JOURNAL OF TROPICAL MEDICINE for November, 1900, suggesting that the cockroach (*Blatta orientalis*), is the means by which beri-beri is propagated.

It was my good fortune some years ago to observe an epidemic of beri-beri in Fiji, of which I propose to give a brief outline. This epidemic is instructive from an etiological point of view, but it does not tend to confirm Dr. Van der Scheer's hypothesis.

In April, 1894, 250 Japanese coolies were imported to a sugar plantation at Labosa, Fiji. Beri-beri had never occurred before in this colony. The Japs were placed on an outlying plantation where Indian coolies were also employed. The dwelling-houses or "lines" were specially built for them on the plan laid down by the Japanese Company who sent them to Fiji. The houses, accommodating forty men each, were built of wood, raised on piles, with wooden floors, and freely open to the air on all sides. The walls, though built of rough unplanned timber, were constructed of a kind of open louver-work, something like fixed Venetian shutters. The floor was covered with Japanese matting. The Japs were very cleanly in their habits. The latrines, on the pail system, situated at some distance from the dwellings, were emptied daily by an Indian topaz, and kept clean.

One month after arrival the first case of beri-beri occurred, but the epidemic did not become general (three cases only being noted during the first four months of domicile) until the beginning of the hot season in September. By the second week of November 219 out of the 250 had contracted the

disease. In February, 1895, the 181 survivors were sent back to Japan.

As the men were attacked with beri-beri they were removed to the plantation hospital, some four miles distant on the home estate, until that hospital was full, then the remaining cases were treated in their own houses. The plantation hospital consisted of three detached wooden buildings, with accommodation for 120 patients. One building was set apart for the Japs, the remaining two held the sick Indians. All three buildings swarm with cockroaches. Some of the attendant nurses were Indians. Latrines, connected by a covered way, are attached to each hospital building. If cockroaches are the carriers of beri-beri, this hospital should have proved an admirable breeding ground; yet not a single Indian contracted the disease. On the other hand, cockroaches must have been comparatively few in the Japanese lines, both on account of the construction of the buildings and the clean state in which they were kept, and yet the inmates were attacked wholesale.

Now in this epidemic of beri-beri we have the following factors:—(1) A country absolutely free from the disease. (2) An importation of Japanese on an isolated plantation, where already some fifty or sixty Indian coolies lived in adjacent buildings. (3) The structure of the houses of the two races was totally different; the Japs lived in open, clean dwellings, practically free from cockroaches; the Indians in closed up, dark, ill-ventilated houses swarming with cockroaches. (4) Many of the Japs had, previous to immigration, suffered from beri-beri, perhaps some had the disease latent in their systems if that were possible. (5) Not till the hot season set in, with its accompanying high temperature (mean minimum, September to November, 68·5 to 73 degrees F., mean maximum, 82 to 89 degrees F.) and moisture from heavy tropical rains, did the epidemic take hold of the Japs. (6) The personal habits of the Japanese, who, when not working in the fields, used

to wear the same heavy cotton dressing-gown-like garment day and night, and were accustomed to sleep huddled together, three or four under the same mosquito screen. (7) Japs and Indians associated in the fields, lived in adjacent buildings, were treated in the same hospital, though not under the same roof—they mixed freely together in the open air, but did not occupy at any time the same building, *i.e.*, were not in close personal contact. (8) Out of 250 Japanese 226 contracted beri-beri, whereas not a single Indian or other nationality was infected. (9) On the repatriation of the Japanese, their houses, after disinfection with corrosive sublimate, &c., were altered into the Indian style of dwelling—that is, boarded up, divided into separate compartments, made dark, floors filled in with clay, &c.—and occupied by Indians; they speedily became dirty, for where the Indian coolie is dirt becomes superabundant, and infested with cockroaches. Yet no cases of beri-beri followed.

All the above conditions—heat, moisture, personal habits of crowding together, the slow beginning, the rapid spread of the epidemic as soon as the climatic conditions became suitable—favour, I think, the more generally received theory of infection direct by a slowly infective germ, introduced in this instance either by a man already infected before arrival, or by clothes or other belongings, and propagated by direct contact, or by dwelling in a house saturated with the germs; and negative Dr. Van der Scheer's hypothesis. Had cockroaches been the intermediate hosts the Indians could hardly have escaped, as these insects must have carried infection into the Indian houses both (2) in the plantation lines, and (6) in the Indian hospital; the Indian dwellings and Indian habits, as we have seen, being particularly well adapted to such a mode of infection.

HOW TO AVOID PRICKLY HEAT.

By MAJOR R. R. H. MOORE, M.D., R.A.M.C.
Barrackpore, Bengal.

IN May, 1899, I began to use cocoanut oil gently rubbed into the skin to allay the irritation of prickly heat. I used it very cautiously at first, but soon found it both pleasant and inoffensive.

A couple of months afterwards I read Mr. Frederick Pearse's excellent paper on prickly heat in the June, 1899, number of the JOURNAL OF TROPICAL MEDICINE. I was thereby encouraged to use the oil more extensively and to abandon the use of soap in the bath. Since then I have been able to keep free from prickly heat, though living in the steamy climate of Lower Bengal. I have also obtained a number of converts to this treatment, many of whom speak of it most enthusiastically. I publish this in the hopes that others may be led to follow our example.

There is, however, a strong prejudice against renouncing such a national institution as soap, and a still stronger one against adopting what many are pleased to term the filthy native habit of anointing one's skin with oil. Like other prejudices these are without reasonable foundation.

It is quite possible to clean oneself in the bath without the assistance of soap, as Mr. Pearse says. "Soap is only required when bathing is neglected." In hot climates this is surely the case, where as a rule baths are taken twice a day.

At first when soap is given up the pleasure and satisfaction of the bath is somewhat diminished, the hand no longer glides smoothly over the body in a creamy lather, it sticks unpleasantly, the contact is distasteful and the epidermis peels off visibly. This discomfort is only temporary, after a time the skin becomes firm and glossy, and the hand glides over it as before, with the difference that the smoothness is now the smoothness of a firm healthy skin, not the meretricious smoothness of an injurious compound the antecedents of which are doubtful.

The oil recommended by Mr. Pearse is a mixture of almond oil and lanoline. I have not tried it. I have found cocoanut oil satisfactory in every way. It is a clean, non-greasy oil which seems specially adapted for the skin, as the natives found out centuries ago. It has the further great advantage of being readily procured in any native bazaar, and is exceedingly cheap.

It is difficult to get Europeans, in India at least, to believe that cocoanut oil is not a filthy-smelling product, or that it can be rubbed into the skin without giving rise to any unpleasant aroma. Such, however, is the fact as I have proved in many instances.

Fresh cocoanut oil has only a very faint smell, when rubbed into the skin this disappears almost, if not quite, entirely. If kept too long, however, the oil turns rancid, and then it stinks abominably. The smell of the rancid oil may frequently be detected amongst the lower classes of the natives. When such is the case the smell comes from their clothes which are saturated with the oil and not washed. This, however, can no more be used as an argument against its use than it can against eating butter.

The fear of the oil spoiling one's clothes is also groundless. The skin absorbs the oil, it is not like oiling a piece of metal; after two or three minutes' gentle rubbing the oil disappears, and you can rub yourself with a towel without any coming off, unless of course a great excess has been applied, then the towel will remove the excess.

The best time to put it on is, I think, before going out for the evening's exercise; strip, pour a little of the oil into the palm of the hand, and rub it over the body from the neck to the ankles, get your servant to do your back. It is not advisable to use sponge or rag, as they are not easily cleansed and so become offensive. When done rinse your hands in plain water and dry. If necessary they can then be washed with soap.

When you come in to dress for dinner, take a bath, using no soap. This is the time when you will appreciate the benefits of the oil. You find you can dry yourself perfectly; the skin is not, as is usually the case in steamy climates, sodden and clammy, it is, on the contrary, firm and glossy; you can pass your hand over it with a sense of pleasure, you have also a pleasant sense of coolness, and you can proceed

to dress without breaking out into fresh perspiration. There is no reason why the oil should not be used twice a day if necessary; about a tablespoon each time.

I do not think that the application of the oil interferes with the activity of the sweat glands. I am not sensible of any diminution of perspiration; I take exercise as freely as ever, and regard the admonition to limit one's drinks as a counsel of perfection not likely to be followed after hard exercise in Lower Bengal. From this I argue that the excessive activity of the sweat glands is not the *direct* cause of prickly heat. In this I agree with Mr. Pearse. He, however, is inclined to regard the affection as a seborrhœa. He says, "I look upon prickly heat as an acute seborrhœa." In proof of this he relies chiefly upon the distribution of the eruption.

But what sets up the seborrhœa? Mr. Pearse says, "Soap removes sebaceous matter from the surface of the skin . . . the sebaceous glands are thus unduly stimulated to produce more secretion, while at the same time the excessive perspiration is also irritating them to lubricate the surface." As soap is freely used in cold climates without producing seborrhœa, it is difficult to understand why it should do so in hot.

Mr. Pearse evidently considers excessive perspiration an important element, for he says, "Anything which excites perspiration 'brings up' the rash and aggravates all the symptoms;" and again, "It seems that the prolonged sweating excites at the same time the activity of the sebaceous glands."

The latter statement is the important one, and it appears to be open to doubt; it appears to have been invented to suit Mr. Pearse's theory. It is stated in an indefinite way and no proof of its accuracy is given. That either soap or excessive perspiration can produce an acute seborrhœa remains to be proved.

Though I agree with Mr. Pearse as to the proper method of treating prickly heat, I differ as to its causation. I believe it to be an irritation of the skin produced by the constant bath of perspiration in which the body is kept in hot muggy climates. This brings it into line with intertrigo and the so-called "flannel rash," eruptions caused by irritating secretions from the body.

As for its distribution, I hold it to be largely accidental; influenced to a great extent by clothes, their nature, amount, and manner of being worn; and also by the obesity of the individual. The places it selects are those where perspiration tends most to collect.

The skin is naturally intolerant of prolonged exposure to moisture, nature's protective greasy coat offers but a feeble resistance, and in steamy climates it rapidly becomes sodden. We increase the evil by removing the greasy coat by the use of soap, and keep up a constant vapour bath by means of flannels. The result might readily be anticipated.

In climates where the diurnal ranges of temperature are considerable, flannel no doubt is useful, but in Lower Bengal in the rains, when the temperature varies but little, and the atmosphere is saturated

with moisture so that evaporation is reduced to a minimum, they do more harm than good. The cholera belt is a sure producer of prickly heat under these conditions.

If this be true the rational treatment of prickly heat is (1) to preserve nature's protective coat by abandoning the use of soap, and (2) to reinforce it when necessary by some lubricant. By adopting these simple means many of us in Barrackpore have saved ourselves from the inflictions of prickly heat during the hot seasons.

A CASE OF BILHARZIA OF THE PERITONEUM.

By FRANK COLE MADDEN, M.B., B.S.Melb., F.R.C.S.Eng.
Professor of Surgery, Egyptian Government School of Medicine;

Senior Surgeon to Kasr-el-Aini Hospital, Cairo.

SINCE its discovery by Bilharz in 1851, bilharzia of the bladder and rectum has always attracted the attention of pathologists, especially Cobbold, Griesinger, and Sonsino, who have worked in this country; but it is only during the last fifteen years that the widespread dissemination of the parasite throughout the various organs and tissues of the body of the native Egyptian has been recognised.

It cannot be said, however, that our intimate knowledge of the pathological wanderings of this extraordinary worm has been very much increased, for most of the instances of erratic bilharziosis are found by accident. We know that the worm and its ova are carried by the portal vein and its vesical and intestinal radicles, and that it is possible even for the worm to make its way against the course of the blood stream and so reach parts in which its presence was formerly difficult to explain (Scheube); while some even hold that the worm may go straight to a part without the intervention of the blood stream (Kartulis).

No doubt, when sufficient material has been collected, the chain of infection will become complete, and we may then be able to cope more satisfactorily with the invader before the worm itself, its ova and its embryos have become disseminated throughout the organism.

The most generally recognised seats of tumours resulting from bilharzia are the bladder and what we may call its appendages (the ureters and kidneys above and the urethra below), and the intestinal tract, especially in the lower part of the large bowel in the sigmoid flexure and rectum,* though it now seems not uncommon to find tumours along the length of the descending colon.

Cases have also been reported and are occasionally noticed of bilharzia of the vagina,† and from the observations of Rüffer and Symmers many other organs and tissues are not at all uncommonly affected.

Scheube‡ quotes many interesting cases and among them one of Sonsino's where the vesiculæ seminales

* *Practitioner*, May, 1899.

† *Lancet*, June 24, 1899.

‡ Scheube, *Die Krankheiten der Warmer Länder*, p. 413, 1900.

were much swollen and contained many calcifying ova. Mention is made of the extension of ova from such cases in the semen, which would probably explain some of the cases of primary infection of the vagina, in which no evidence of bilharzia in any of the neighbouring organs can be found. § The veins of the penis have also been found loaded with small embryos and ova.

He also mentions several cases of carcinoma, sarcoma, and fibro-adenoma containing ova (Kartulis); and I feel certain that some of the cases of extensive epitheliomatous growth around the anus met with in Egypt are not true growths, being partly bilharzic in origin, though it is only rarely that the ova can be discovered microscopically.

The prostate, the urethra, the ureter, the pelvis of the kidney, with all possible septic and extension complications along the whole urinary tract, are constantly involved, and though the general impression appears to be that *all* stones in Egypt are bilharzic in origin and therefore phosphatic and soft, || this is not the case, though many examples of such stones are met with in all the usual situations. Bilharzia ova have also been found in hæmorrhagic infiltrations and with enlarged mesenteric glands. ¶

The present case is that of a young Egyptian male, aged 26 years, who was admitted to Kasr-el-Aini Hospital, under Dr. Sandwith, with a history of fever, probably malaria, and the passage of blood and mucous in the fæces during the last two years. Three months before admission he had pain in the right side of the abdomen with colic, which lasted for three days. There has been some vomiting at times and pain in the abdomen and flatulence after meals. The urine contained no albumen, sugar, or bilharzia ova. The fæces were examined microscopically and contained blood corpuscles and bilharzia ova. Small villous bilharzia masses were felt on the anterior wall of the rectum just below the prostate. On abdominal examination both liver and spleen were enlarged. Extending across the middle line just above the umbilicus was a horseshoe-shaped swelling, which was very hard, dull on percussion, fairly movable and somewhat tender. The swelling varied in size and did not always occupy the same position, moving most readily towards the left side until it was almost under cover of the ribs. My provisional diagnosis was a tubercular mass in the omentum and on percussion a rather dilated stomach appeared to come just down to the upper edge of the mass.

As the patient began to lose weight and had severe pain at times, Dr. Sandwith transferred him to me for exploratory laparotomy.

An incision was made in the middle line above the umbilicus and the omentum presented into the wound. It was very thin and ill-developed, and contained several fleshy masses scattered throughout its substance. On further search a large number of soft swollen mesenteric glands of various sizes were discovered. These became larger and firmer as they were traced down towards the mesenteric attachment.

Just under the abdominal incision a soft nodule, the size of a large almond and attached to the parietal peritoneum, was cut across. As these appearances seemed to indicate a sarcomatous infection of the peritoneum further operation did not appear to be advisable. However, the transverse colon was examined and found to contain a large hard mass within the lumen of the gut. An incision was made into the colon and exposed a fleshy tumour with a smooth undulating surface, firmly incorporated with the wall of the colon at its mesocolic attachment, and extending for some six inches along it. There was no attempt at a pedicle, and imagining that our diagnosis of sarcoma was confirmed, no attempt was made to excise the tumour. The incision in the gut was closed with Lembert's sutures, the peritoneal cavity washed out with normal saline solution, and the abdominal wound sutured with silkworm gut sutures.

Much to our surprise Dr. Symmers reported that the omental and peritoneal nodules contained hundreds of bilharzia ova. None, however, were found in the particular mesenteric gland which had been removed for examination. Unfortunately no piece of the mass in the colon was removed, but from the presence of bilharzia in the rectum and in other situations in venous connection with the colon, it is reasonable to infer that it was also a bilharzia tumour.

The subsequent history of the case was interesting. He had no bad symptoms, very soon took all his food by mouth, began to grow fat, and lost all his pain. What is more extraordinary is that the tumour gradually disappeared and could not be discovered on careful examination when the patient left hospital six weeks later.

This disappearance of bilharzia tumour after operation I have noticed in another case, in which a very large tumour of the bladder completely disappeared after a suprapubic cystotomy, in which the bladder was sutured to the abdominal wall. The ova also disappeared from the urine.* Such a favourable result is not at all usual with bladder cases; for, in general, all that can be done is to provide perineal drainage, destructive changes in the ureters with cystic kidneys and pyelonephritis, found *post mortem*, furnishing striking evidence of the futility of further operative interference.

THE TREATMENT OF CHRONIC GRANULAR LIDS.

By A. B. DALGETTY, C.M., M.D.
South Sylhet.

THE usual method of treating this troublesome disease by applying various caustics and disinfectants is certainly a tedious process, and on the whole an unsatisfactory one.

I have found the following radical proceeding to give immediate relief and apparently permanent benefit, and as it does not appear to be generally known I will give a short account of it.

The conjunctivæ and the neighbourhood of the eye

§ *Lancet*, June 24, 1899.

|| Stone Number, *Indian Medical Gazette*, August, 1900.

¶ Scheube, *Die Krankheiten der Warmer Länder*, p. 413, 1900.

* *Records of Kasr-el-Aini Hospital*, 1900.

having been thoroughly disinfected with corrosive sublimate, 1 in 1,000, 10 minims of a 5 per cent. solution of hydrochlorate of cocaine are injected into the loose skin of the lid and the same solution is also freely and firmly rubbed into the everted and thickened conjunctiva. The eyelid is then grasped with a pair of fine-bladed forceps in such a way that the whole breadth of the diseased portion is thoroughly everted and exposed; then with a pair of scissors, curved on the flat, the entire thickness of the hardened membrane is removed right down to the healthy tissue beneath. When the forceps is removed free bleeding ensues, but it is arrested at once by the perfect apposition of the eye-ball. A pad of lint and a bandage is all the dressing required. The lids are drawn apart and the exudation washed away with boracic lotion twice daily until healing takes place, usually in four days.

There is no deformity of the eyelid as a result of this treatment, neither is a general anæsthetic necessary, nor slitting of the canthus.

SOME INSTANCES OF UNTREATED SYPHILIS.

By A. B. DUPREY, M.R.C.S., L.R.C.P.
Grenada, B.W.I.

In a former paper I pointed out that syphilis in the West Indies was a common disease notwithstanding the dictum of authorities to the contrary; that the two diseases yaws and syphilis were dissimilar and bore no relation whatsoever with one another. Syphilis, though appreciably modified as it must necessarily be among the dark races, is nevertheless syphilis, and can be recognised as such if one takes the trouble and interest to effect a diagnosis.

The stages of syphilis may not be as regularly made out as in England, nor the eruptions be necessarily identical with those observed in the European malady, still, however, it is common hereabouts and has been so for a considerable number of years, and the fact of its being mistaken for other diseases can no more be doubted. The vexed question of contagion in yaws, for instance, has, I have no doubt, originated from syphilis having been inoculated instead of the former disease. That this is so one can gather from descriptions of yaws by certain authors, such, for example, as Numa Rat, quoted by Croker, and which seems to me more readily applied to the manifestations of syphilis than those of yaws. The student of tropical medicine would find it extremely difficult to diagnose yaws on that description; on the other hand, should he expect to find the classical stages of syphilis such as represented to him in books, his disappointment, I fear, will be great. Diseases admit of vast modifications under climatic influences, it is true, and what really are the same diseases under different conditions are often described as totally different, and *vice versa*; yet in tropical syphilis, though there may be some slight variation owing to climatic and racial influences, is still sufficiently well marked not to fail in its recognition. There is a wide field for the investigation of diseases in the tropics that are

really modified versions of those seen in a colder climate, and none more so than skin affections, which particularly offers to the student an interesting and attractive study. Tropical skin affections are not all parasitic, as seems to be the general belief; for, as I am inclined to believe, a considerable share may be put down to the ingestion and the assimilation by the gastro-intestinal tract, which strikes one as being a filter, not only for the transmission of proper nutrition to the body, but which not infrequently suffers the admission of injurious toxins prejudicial to the system.

It is too much to expect to find a roseolous rash on a black skin, and coppery-coloured discolourations are certainly very difficult of discernment. I have seen the roseola only once and that in a native of a fair complexion; the rose spots of typhoid fever are never seen in the tropics, at all events, I have never seen them either in fair or dark complexioned natives, yet typhoid is a frequent visitor in the tropics as evidenced by *post-mortem* examinations.

In district practice crowds of marasmic children are brought to the medical officer with no other history than that of a gradual dwindling away; their little faces are pinched and the flabby skin as it were directly superposed on the skeleton without the intervention of any subcutaneous fat; they look like little withered old people. To obtain any reliable history from the parents is well nigh impossible, though with females some points might be gained as to the number of miscarriages and children they have had, how many were born dead or how many died during infancy. The labouring classes are convinced that the doctors cannot treat marasmus, and invariably end by taking their children to the quacks, who without any knowledge of the malady prescribe mercury with the most happy results, thereby confirming the people in their opinions. We are too apt to mistake hereditary syphilis either for tuberculosis or innutrition. The people are not alive to the dangers of syphilis and neglect to come forward for regular treatment. Many years ago there used to be in Trinidad a law compelling venereal people to present themselves for treatment once a week, but for some reasons best known to legislators this was allowed to subside, and now syphilitic people roam about at leisure untreated. Legislation, in my opinion, is urgently called for in those places where syphilis is common so as to prevent this broad-cast sowing of a formidable disease.

(1) A woman, aged about 22, had a tubercular syphilide on the face and forehead; she was coloured, and in this instance the diffuse erythematous blotches on her face were distinct. She was in bed with fever, headache and sore throat, she complained of aching pains all over her body. There was no rash anywhere on the body except the face. The initial sore was not located. After a short course of anti-syphilitic treatment she got up but never returned, although she was warned and within easy reach of the dispensary. This indifference to a grave malady is universal in these islands, and it is only when the disease is far advanced that advice in the proper quarter is sought.

(2) A boy, aged about 6, was brought for bad eyes. All kinds of local remedies had been tried, the advice of friends had been rigorously followed, and various washes, each in turn, had been used, when finally the doctor was thought of. He was emaciated, stunted and almost idiotic; he was hard of hearing; his face was long, drawn, and *blasé*; his teeth were small and rotten; his eyes were closed and two streaks of tears rolled down on each withered cheek. He had a pustular eruption on the lobules of each ear which extended to the outer meatus resembling impetigo. On raising the upper lids of both eyes they were found to be watery and acutely inflamed; interstitial keratitis apparent in both eyes. In this case there was a clear history of syphilis in both parents, though this was hardly necessary, the evidences of hereditary syphilis being so palpable as to admit of no doubt whatever. I saw the child but once after the first visit, and the mother thought him so improved that she never appeared again.

(3) A coloured man, a sailor, was admitted on September 9, 1900, in a most pitiable condition. He must have been about 35 years or possibly more. He was, to use a common term, mere skin and bone, and was carried as he could not walk. There were no signs of disease either of his lungs or heart that I could make out. Both legs from the ankle upwards were ulcerated, shallow and serpiginous in character, healing below and spreading upwards, leaving behind a tract of unhealthy, ugly-looking scars. His voice was indistinct, which I attributed to his weak condition. There was no sore throat or other signs of syphilis. He was treated with iron and nux vomica, and both ulcerated legs strapped over a dressing of boracic acid ointment. On October 26 there developed double iritis which rapidly disappeared under syphilitic treatment, from which time he began to improve, and it was not long before he put on flesh and was able to move about unassisted.

(4) Coloured man, a sailor, of a strong and muscular build, recently arrived from Trinidad. He had had gonorrhœa a couple of months back, though he denied having a sore. There was a slight urethral discharge but no evidence of a sore could be found. A papular eruption covered his body specially marked over his face and upper part of the trunk. The papules were larger and more indurated than those of yaws and moreover were not capped with yellow points such as is characteristic of that disease. There was sore throat and the fauces were congested. He was treated for syphilis and warned as to the gravity of his condition. I saw him accidentally some weeks after and he informed me he was now well and did not want any more medicine.

(5) A little girl aged 10 years had been ailing for the last eighteen months. The mother said the child was quite well before and attributed her indisposition to supernatural influences—"She is possessed by spirits, sir." She first attracted attention by picking up various "bits of things" from the ground and putting them in her mouth. Her father died from some obscure disease contracted in Trinidad. The mother had four children by the patient's father, three of whom died in infancy; no miscarriages. The patient was a well-nourished, well-shaped child;

her skin was black and smooth; her speech was thick and limited to two words, "ca' me," that is to say, she fancied she was always being called; she was also partially deaf. This child was not brought for treatment but had strayed into the house where I was seeing some patients, repeating the words "ca me! ca' me!" I begged she should be submitted for examination. Over both lungs, front and back, could be heard ronchi and moist rales; the heart was normal; she coughed slightly. Her conjunctivæ were congested and of a dirty colour and somewhat of a yellowish tinge; her nose was well formed; her tongue was thick and impressed me as being too large for her mouth, the throat was not affected; the teeth were notched, pegged, and stunted, representing in fact a remarkable example of Hutchinson's syphilitic teeth, and which were, beside her condition of partial deaf-mutism, the only conclusive evidence of hereditary syphilis. About ten days after her admission to the district hospital, all the physical signs of bronchitis had disappeared and her eyes had cleared up. The mother came for her after a course of six weeks' treatment, and she was discharged contrary to advice. She could then articulate more distinctly and would ask for cake. Her habits which were originally dirty improved, and "she was not so mad." The evidence of syphilitic affection of the brain shown in this case is one not often met with in the young. Goodhart mentions syphilitic idiocy which is said to be rare and progressing to dementia. As yet this child could not have been described as an idiot, for even after a short course of treatment she showed marked intelligence, being able to recite a part of the alphabet and count up to twenty, which she remembered from previous tuition, but hers was a condition that will gradually but surely culminate into one of complete dementia in the absence of proper treatment.

(6) Portuguese, aged 25 years, and a native of the West Indies, was practically bed-ridden; he was extremely anæmic and emaciated, and presented rupial sores irregularly distributed on different parts of his body. They were the most typical syphilides I ever saw in the West Indies; the crusts were thick, dirty, and laminated, shrunken in some, showing the bevelled edges of the ulcers beneath, and each surrounded by an erythematous areola. There were scarring of the legs, arms, and forehead. The tibiae were very tender on pressure and presented a few small swellings (gummata) with rounded apices soft and doughy to the feel as if ready to break down. There was no evidence of a primary sore either on the genitals or elsewhere, and the case was clearly hereditary. The mother had five children who died in infancy and one miscarriage. He had a 24-ounce mixture containing 15 grains of potassium iodide to the ounce, and ten days later walked into my consulting room looking, if not the picture of health, yet greatly improved from his former condition. This case had received hospital treatment for, it is said, a considerable time, and the only inference that can be drawn from his severe condition is that his case was not diagnosed.

Thus it will be seen that "tropical" syphilis, though to a certain extent modified from the syphilis

of the colder climate, yet does not admit of such vast modifications as to be unrecognisable or be mistaken for another disease. My own belief is that the secondary manifestations of acquired syphilis is very much in abeyance and often so slight that patients do not recognise the gravity of their condition until the disease has made considerable progress. The primary and tertiary stages are severe, the primary sore often going on to phagedena, which I believe to be a condition peculiar to the tropics and essentially pathognomonic of syphilis.

My thanks are due to the Colonial Surgeon, Dr. Orgias, for permission to publish the above.

CEREBRO-SPINAL FEVER ON COOLIE VESSELS.

By DR. W. K. MILEY.

Surgeon-Superintendent of the ship "Elbe."

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THE outbreak here reported took place on board a coolie immigrant ship bound from Calcutta to Georgetown, British Guiana. She started from Calcutta on October 18, 1900, and reached her destination on January 5, 1901.

Total number of cases, 17.

Total number of deaths from this disease, 14.

First case noticed on October 18, 1900 (day of embarkation).

Last case first noticed on November 9, 1900.

DETAILS OF OUTBREAK.

(1) First case noticed evening of day of embarkation, *i.e.*, nine to ten hours after he left depot.

(2) Patient was not under treatment on board previous to occurrence of this attack.

(3) No suspicious cases had occurred previously on board.

(4) I was told in Calcutta by Mr. Mitchell and others that cases of cerebro-spinal fever had occurred in Depot previous to embarkation. The Chief Com-pounder told me that coolie No. 392, Jhagni, who had been assisting in the Depot hospital, told him that on the evening before embarkation a coolie who was to have come in this ship was attacked in Depot with fever, delirium, &c., and died within a few hours.

(5) As first case occurred on day of embarkation there was not time for cases of fever to occur on board previously; but during first three weeks (the period during which all cases but one—which occurred in beginning of the fourth week—of the cerebro-spinal fever occurred) was very much larger than I had observed on previous voyage (*sic*). During these first three weeks there was little else on sick list save cerebro-spinal fever and fever.

The numbers were:—

	1st week.	2nd week.	3rd week.
(a) Cerebro-spinal cases ...	7	5	4
(b) Fever cases needing special attention ...	7	55	44
(c) Fever cases, short duration, needing little treatment, chiefly entered for observation lest severe symptoms should ensue ...	14	9	38

In succeeding weeks the numbers were:—

	4th week.	5th week.	6th week.
(a) Cerebro-spinal cases ...	1	—	—
(b) Fever needing attention ...	19	—	—
(c) Fever, slight cases ...	15	—	—

I have classified as cerebro-spinal fever only such cases as showed severe head and spinal or severe head symptoms; but almost all the fever cases, in some of which general symptoms were slight, were marked by headache which in many cases was described as severe. The complaint of this symptom was much greater than I have met with in fever cases of previous voyages. Many coolies (many more than I have noticed on previous voyages) complained of headache without other symptoms. The fever, too, in many seemed to cause more prostration and to leave the patients more enfeebled than is usual in my experience. In the fourth week of the voyage there was but one case of cerebro-spinal fever (he is now, January 5, making good progress to complete convalescence) and the ordinary fevers were not so severe nor were the headaches.

The type of these fever cases was mostly intermittent, but many, especially the severer cases and in early stages of the disease, partook much of the remittent type. Amongst such a number of cases, especially in ignorant coolies it was not practicable with my staff to nicely differentiate even if actual division existed, which I doubt.

METEOROLOGY.

Weather should have suited coolie on ship excellently, fine in Calcutta for some time previous to and at embarkation, and very fine for first three weeks of voyage (save for some five or six days when we had some heavy rain squalls). It has been one of the finest voyages I have had; people were much on deck and even in heavy rain the ventilation of 'tween decks was better than I have had before, for I have used here for the first time specially designed diffusers which enabled me to leave the air shafts wide open without tents (tents interfere somewhat with ventilation) even during the heaviest rain. There was much sunshine and these diffusers being made partly of glass allowed the sunshine to penetrate into 'tween decks.

The winds were:—First week, light north-westerly to north, then westerly to southerly; second week, south-easterly, east, calm and variable; third week, light to fresh westerly, and south-westerly to south-easterly trades.

During the first four weeks no storms or thunder; on one or two nights some heat lightning. Temperature in 'tween decks varied from 88 to 90 degrees (occasionally 91 to 93 degrees), but was not unduly oppressive, for though weather was warm (about 84 degrees at noon in chart room on deck) the fine nights enabled me to keep the hatches, &c., open.

EVIDENCE OF CONTAGION.

(1) I think there can be no doubt as to the disease having been imported by the coolies. The first case was noticed within a few hours of embarkation, and the disease existed in Depot previous to embarkation. No evidence of contagion from case to case. The patients came from here and there through the ship.

(2) Of those in attendance on the patients none were attacked by cerebro-spinal fever. One hospital sirdar suffered from severe fever but the symptoms did not justify a diagnosis of cerebro-spinal. The hospital topaz who had to remove the dejecta (most of which were passed in bed), the nurses who attended the female patients, and the other two sirdars who kept watch in the hospital where these cases were, sometimes four to six at a time, were unaffected. No two cases occurred in any one family, though of two of the fatal cases one was a man with a wife and child, one a woman with a child who remained with the mother throughout. I was obliged from want of room to treat this case in female sick bay 'tween decks where there were many other women and children about; yet I had not the slightest reason to think that any of these women or children were affected.

Some chest and dysenteric patients treated in same hospital as the cerebro-spinal cases showed no evidence of contagion.

There had been fatal cases of this disease on this ship during her voyage with coolies to Fiji in the earlier period of this year.

SANITARY DEFECTS.

None that I know of so far as the ship is concerned. 'Tween decks were clean and dry, ventilation and accommodation good. She measured for 590, but carried this time only 587½ statute adults. The disease dying out in early part of voyage would point to conditions on board being inimical to it. Water was good.

EFFECT OF MEDICAL TREATMENT.

I don't think medicine effected very much. Out of seventeen cases only three now (December 22) survive, and these are probably the usual proportion which survive in any such outbreak. I have no statistics by me. The first eight cases, all fatal, were treated chiefly by blistering and cold lotion to head, calomel and saline aperient and iodide and bromide mixture. Later I tried quinine (grs. 20 to 25 daily). Three of these still (December 22) survive, but cases not numerous enough to justify belief that their survival is due to quinine. In two cases treatment was chiefly expectant—nourish as much as possible, relieving headache—and both these proved fatal. Morphia hypodermically seemed to relieve headache and restlessness in one case (still surviving and making good progress to complete recovery) in which these symptoms were very marked. Combination of antimony and opium seemed in a couple to relieve headache; but I feared to press it much in a debilitating disease where I had no skilled attendants to be by the patients. Owing to large number of sick, &c., it was impossible for me or my compounder to give very much time to individual cases.

REMARKS.

I think the disease was brought on board by the coolies. Its prevalence in Depot, its development on board within a few hours after embarkation, and its ceasing after first twenty-four days (last case occurred on November 9) are against the ship being a factor in its causation or continuance. Whether

it arose in Depot or was brought there from up country by the coolies I have no means of knowing. There seems to me a connection between these cerebro-spinal cases and the exceptionally large number of fever cases in which prostration and headache are marked features. It seemed as though the coolies had been exposed to some epidemic influence tending to cause fever, and that this fever in its severer form was the fatal cerebro-spinal variety, while in its less severe form it showed as the remittent intermittent kind. Possibly such influence prevailed in the districts whence the coolies came, and that the change to sea air and healthier conditions on board ship soon wore it out.

Prevalence of famine in India during the past year may have had something to say to it. The coolies on the whole were not as robust a lot as I have often had. Most of those attacked by cerebro-spinal fever, however, were not from amongst the weedier looking lot on board.

None of the officers or crew or compounders were attacked, nor was I myself.

EXTRACTS FROM CASE-BOOK.

CASE 1. Ramberich.—*October 18.*—This evening complained of fever for which he was put into hospital and given Dover's food. There was nothing special noticed at the time. At 6 a.m. next morning he was lying on his back apparently unconscious; at times twisting about; no moans or cries; temperature 102 degrees, pulse about 120, respiration rapid. Gave calomel grs. 3, following by saline; cold lotion to head; quinine tonic next.

October 19.—Bowels have acted; is sensible; took some chicken broth; much headache for which I gave 20 grs. of bromide. 3.15, cold and clammy in collapse; is sensible and swallowed some brandy; I injected some also hypodermically; put hot bottles around him but suffusion set in on the lungs causing loud loose rales; at 5.25 he died. Just before death he got very restless, wanted to sit up; said had much headache. There was no eruption and no swellings. At first I regarded death as due to collapse in fever, but occurrence of other cases linking this one to those in which symptoms of cerebro-spinal fever were more evident, and knowledge that cerebro-spinal fever had prevailed in the Depot, made me regard it as a case of this disease.

CASE 2. Mohabir.—*October 20.*—Found him about 7 p.m. last night in 'tween decks heavy and lethargic; eyes heavy but not injected; lies on back moving arms about aimlessly or rolls from side to side; slight moaning; semi-conscious when touched or loudly spoken to; lungs clear; heart and pulse fair; won't take drink. Moved to hospital and blistered head. Temperature 98.5 degrees. To-day is much same. Temperature 99 to 99.3 degrees. Gave calomel and saline purge.

October 21.—More conscious; takes milk and medicine freely. Gave quinine tonic next. Temperature 99.5 degrees. About noon temperature rose to 101.5 and later 102.5 degrees, and with this lethargy returned; he took no notice when spoken to and there was much difficulty in getting him to swallow anything.

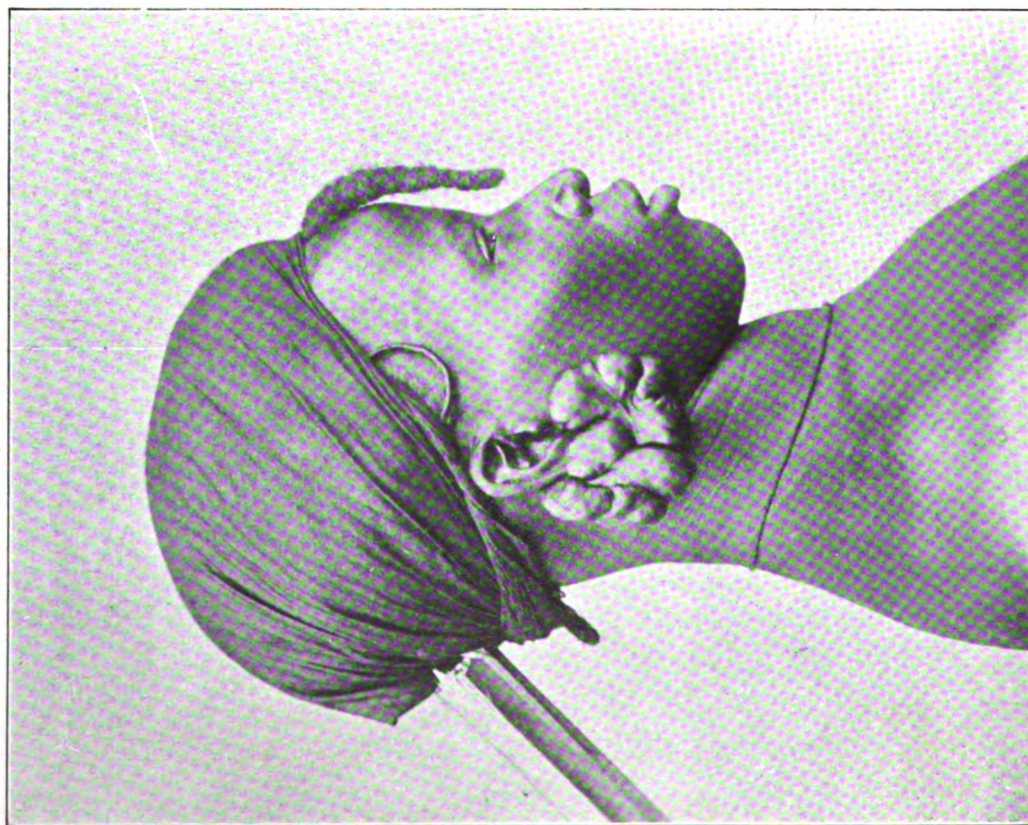


FIG. 1.—Keloidal fibroma of right ear (Recurrence).

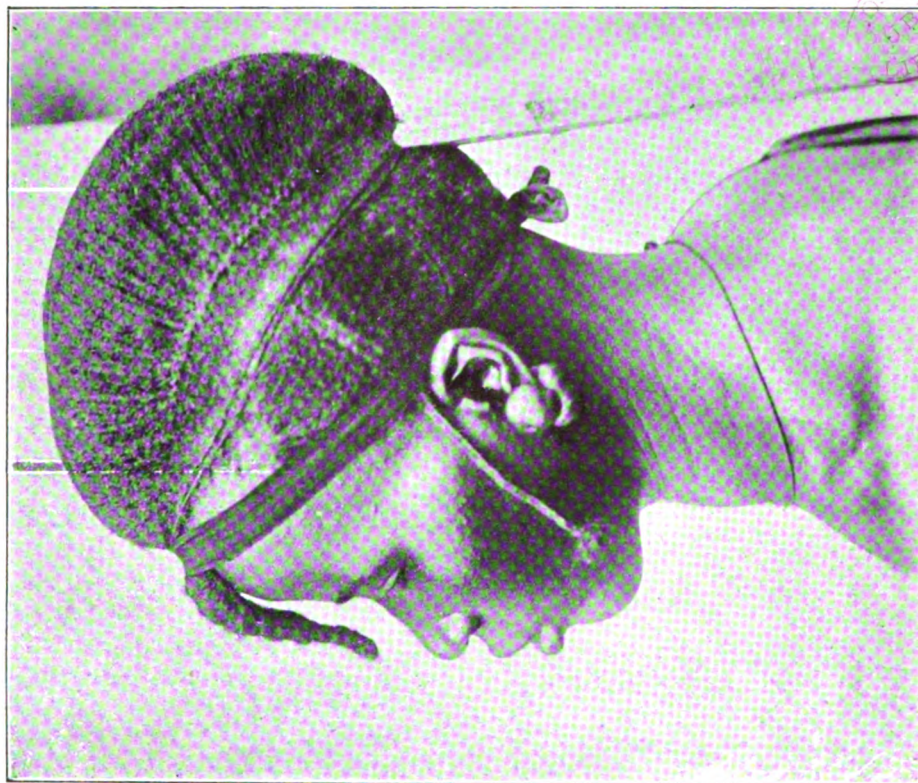


FIG. 2.—Keloidal fibroma of left ear.

KELOIDAL FIBROMATA.

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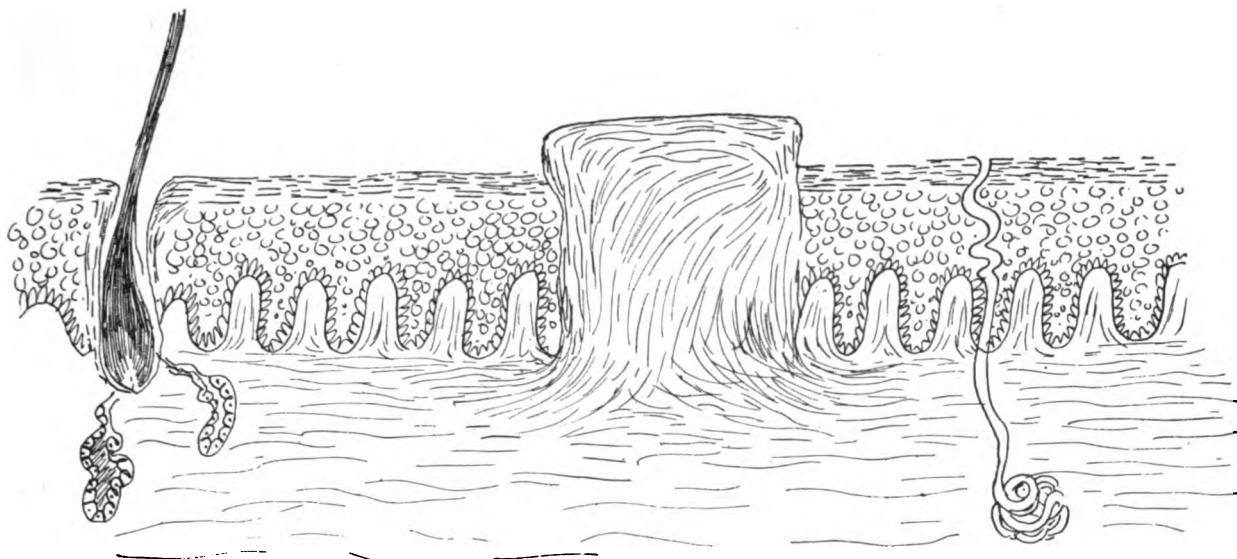


FIG. 3.—Diagram exhibiting the development of ordinary cicatricial keloid.

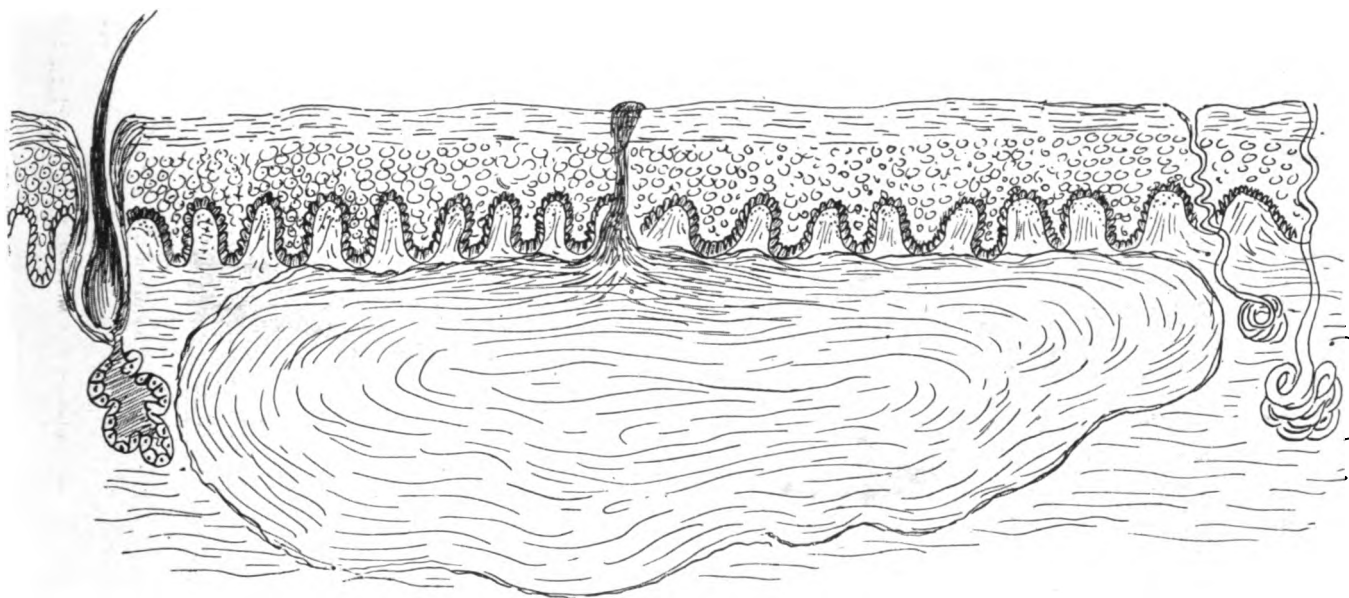


FIG. 4.—Diagram showing the development of the keloidal fibromata.

KELOIDAL FIBROMATA.

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October 22.—In early morning temperature was 104·5 degrees; there was much suffusion on lungs causing loud gurgling rales. Died at 6.37 a.m.

CASE 3. Pariyag.—October 22.—Fever; heavy and drowsy; forehead and lower limbs. Moved to hospital and gave saline purge. Then at 1.30 p.m. gave quinine and antipyrine aci. grs. 5, and at 3 p.m. quinine grs. 5. Diet small. Temperature, 6 a.m., 103·5 degrees, 7 p.m., 98 degrees. At 5 p.m. bowels had been moved; he was sweating, and headache almost gone.

October 23.—Skin cool, is quiet and conscious. Suspecting it to be another case of cerebro-spinal fever I put him on iodide and bromide mixture, and had head blistered.

October 24.—Restless and wandering and moaning; answers questions fairly clearly; skin almost normal.

October 25.—Skin cool; throws arms about and moans; tried to pass urine but failed. I drew it off. Takes nourishment well. Continue mixture.

October 26.—Lies on side, ribs drawn up, fairly sensible when questioned but chatters a lot of nonsense to himself. Temperature at 6 a.m. 101·4 degrees; costive. Continued mixture and gave calomel and saline purge.

October 27.—Early morning is moribund; lungs suffused, large loose rales. I injected brandy without apparent result. Died at 7.45 a.m. Till this morning he seemed to be doing fairly well; seemed less prostrated than the other cases; took nourishment fairly well, and had survived longer than any other case which had occurred up till then. The change for the worse occurred during the night.

CASE 4. Gurdin.—October 22.—10.30 a.m., dull and heavy. Scarcely speaks but nods head when asked if has headache; heart fair, lungs clear. To hospital, head blistered; calomel and saline purge, then iodide and bromide mixture.

October 23.—Skin cool; restless, moaning and crying out; fæces in bed; at times takes milk and medicine, at others won't.

October 24.—Skin hot to-day; later in day suffusion of lungs set in, and at 5.45 p.m. he died. Note: One of my thermometers was broken. This and the pressure of work on me and my chief compounder combined with the difficulty of taking temperatures when patients so restless, prevented me taking accurate observation of temperature.

CASE 5. Jamni.—October 22.—Fever and headache for which I gave antipyrine grs. 5, quinine grs. 5.

October 23.—Heavy and stupid; eyes dull; skin cool; moans and cries at intervals. Put in hospital and gave iodide and bromide mixture and blistered scalp.

October 24.—Much same; costive. Continued mixture and gave calomel and saline purgative.

October 25.—Somewhat sensible; to-night quiet and apparently asleep; pulse quiet and small respiration, quick skin about 99. Still costive; repeated purgative.

October 26.—Skin cool; pulse quick and fairly good; lies on back, sensitive to touch, but takes no notice of questions; quiet through night, and passed fæces in bed; takes medicine and drink, still cool;

some loose rhonchus. Continue mixture, sago, milk, &c.

October 27.—Died at 1.10 a.m.

CASE 6. Gopal.—October 23.—6 a.m., dull, heavy, and weak; had passed fæces in his dhoti; pain in abdomen and over body. Moved to hospital and given ol ricin; head blistered and put on iodide and bromide next. 7 p.m., moaning at times, at others somnolent; twists about from side to side and on to back. Sometimes takes medicine and milk, at other times won't.

October 24.—Skin cool; more unconscious than yesterday. 7 p.m., died.

Death was not preceded by such suffusion of lungs as that which was observed in other cases.

CASE 7. Ramnarain.—October 24.—5 p.m., heavy and dull; temperature 101·5 degrees. Gave calomel and saline purge.

October 25.—Case in cold sweat; heart and pulse feeble; takes no notice. Gave brandy and put on iodide and bromide mixture. 7 p.m., temperature 101·8; more sensible and takes milk; seems to hear when loudly spoken to; lies on back groaning and moaning and moving arms about aimlessly. One free stool.

October 26.—6 a.m., skin cool; pulse weak and quick but distinct; respiration quick; seems to understand, but does not answer when spoken to. 7 p.m., much moaning; surface apparently very tender for he winces when touched; pulse middling. 9.20 p.m., died. Died more quietly than the others. No loud rhoncus preceded death.

CASE 8. Rajkali.—October 25.—7.30 p.m., dull and listless, says much pain in head. Put in hospital and given calomel and saline purge.

October 26.—Skin somewhat hot; answers sensible; says no pain; at times talks nonsense; rolls about at times. Iodide and bromide mixture.

October 27.—6 a.m., been noisy last night, now quiet; says "acchha" but is very lethargic; skin about 100; pulse quick but fairly strong. 8 a.m., respiration quick. 7 p.m., skin cool; wandering; throws arms about aimlessly; at times carphology; continued mixture.

October 28.—6 a.m., got worse in night and is now moribund. 7 a.m., died.

CASE 9. Ramadhin.—October 28.—7 p.m., fever; Doversi grs. 10.

October 29.—6 a.m., cool; much headache; costive. Mag. sulph., later quinine grs. 5 and bromide grs. 15. 4 p.m., severe headache and pain in body; costive. Gave purgative then quinine and bromide. 4 p.m., severe pain head and body; much prostration; sent to hospital and gave quinine and bromide.

November 8.—Chief symptom in this case has been seemingly intense pain in head and over body and limbs. He has not lost consciousness and has been always able to answer sensibly, but for long spells he cries out and groans owing, he says, to pain in head and body. Temperature has run about 100 to 101 degrees, now and then 102 degrees. No convulsions and very slight stiffness of neck. I tried quinine and antipyrine (as an analgesic), sod. salisyl., &c., without much result. Hypoderm. of morphia relieved temporarily and allowed rest at night.

Antimony and opium mixture also seemed to relieve the pain once or twice when I tried it, but I feared to press this mixture owing to the depression. He takes food fairly well.

November 12.—He still holds out. Symptoms much as before. Pain is I think less for he gets good spells of sleep and is quiet for long spells, especially if he thinks I am not near. He is inclined to groan, &c., more when he knows me to be near. He has presented much more of the irritation symptoms than have the cases previously observed in which dull lethargy sometimes alternating with temporary restlessness and soon passing into coma or collapse was the chief symptom.

November 19.—Is I think better; temperature has run from 99.5 to 104 degrees; but in intervals between exacerbations he seems quieter; still much pain head and body and limbs. Treatment has been quinine, at times tinct. opii to allay restlessness and pain, and lint. sapor. to surface, diet sago milk broth.

November 27.—Better on the whole during past week; temperature lower and longer spells of ease from pain. Treatment has been chiefly quinine and wine trional as hypnotic.

December 16.—Much better since 27th. Temperature only once above 99 degrees; has been almost free from pain; sleeps and eats well, and has been sitting out in the open air daily for some days past. The attack has left him very weak and little more than skin and bone. Treatment has been quinine once a day, aromat. mixture with nuc. vom. wine. Diet what he likes.

December 26.—Has been making good progress, but on 22nd I had to send him to sick bay in 'tween decks to make room in hospital for some acute cases. Since he has been complaining of headache and pains in limbs, and has had slight fever at times.

January 5.—Arrived in Georgetown, British Guiana. He has been making good progress during past ten days, and is now looking clearer and brighter and is putting on some flesh, though still thin and weak.

CASE 10. Bunsu.—*October 29.*—6 a.m., complained of fever and headache; very weak and prostrate; unable to walk or sit without assistance. Sent to hospital. Would not swallow saline so I gave a bolus of calomel and jalap, and later antipyrine grs. 3 with quinine grs. 4. 4 p.m., very restless, rolling and tossing about, raising himself on arms and then flopping down again; rolls head about as if in pain; won't swallow and pays no attention to anything said. Bowels cleared; I gave quinine grs. 10 by rectum.

October 30.—6 a.m., skin not at all so hot; pulse fair; lies on back quiet; says "acchha" and no pain; wanders in talk. Quinine grs. 10 per rectum. Noon, seems stronger and more sensible; won't take food; eyes look clearer (they had been dull and heavy). Quinine grs. 10 per rectum. 4 p.m., quinine grs. 10 per rectum. 7 p.m., I gave trional grs. 10 hoping to induce sleep.

October 31.—6 a.m., chattering and shouting all night; drank half-pint milk; temperature about 101 degrees; now quiet on back; answers questions but is heavy and drowsy and feeble. Quinine grs. 10 per rectum bis. 7 p.m., unconscious save to touch.

November 1.—Died at 5.5 a.m.

CASE 11. Jhinka.—*October 29.*—At 3 a.m. she was safely delivered of a living male child. At 8 a.m. she was in high fever. There was nothing noticeable in lochia, womb or pelvis to account for the fever. This made its appearance so quickly after parturition (I don't know if she had raised temperature at time of parturition), and the infant being small and feeble (it died next day) made me believe that labour came on somewhat prematurely owing to the advent of the fever. Much headache. I gave antipyrine grs. 3, quinine grs. 4, bis and bromide grs. 30 at night.

October 30.—Temperature and headache left. M. mag. sulph., then quinine grs. bis Dover at night.

October 31.—6 a.m., cooler; pains less; some prostration; costive; milk in breasts. Pil. col. c. hyox, quinine grs. 5; milk to be drawn off. 4 p.m., still costive; Apenta water. 7 p.m., no stool; glycerine enema.

November 1.—Much same save seems less prostrate; skin about 102.2 degrees; hard dark stools in which a round worm after the glycerine enema; herpes on lip (this is the first case in which I have noticed this). Gave santorius and calomel powders and later Apenta water, and later glycerine enema (the others had not acted).

November 2.—6 a.m., bowels moved; headache less; looks somewhat better; takes a little milk and broth. Quinine grs. 10 bis.

November 3.—6 a.m., temperature about 102 degrees; says better; two stools in which three round worms; pulse weak. Quinine grs. 10 bis.; brandy bis.

November 4.—Passed more round worms.

November 5.—Temperature about 102 degrees; diarrhoea; weak. Gave chlorodyne and brandy.

November 6.—Finding she was passing some mucus I put her on m. bismuth. There is paresis of tongue and some dysphagia; also neck stiff and head somewhat back drawn.

November 8.—6 a.m., Temperature about 102 degrees; very prostrate. As she could not swallow I had tried some broth enemata, but they came away as soon as injected. I tried to-day with bismuth, morph., brandy enema without effect.

November 9.—Died at 11.25 a.m.

CASE 12. Dukhiawa.—This was another case of cerebro-spinal fever. First noticed on October 29, when he complained of being sea-sick. I put him in hospital and under treatment. He showed symptoms of nerve irritation more, and those of stupor less, than some of the others. As the acute stage subsided a bed-sore formed over sacrum. (It has been hard work to keep these patients clean, nearly all of them in the acute stages passed urine and faeces in the bed; and as many topazes were ill with fever or sea-sickness the sanitary work was not easy. I managed fairly well by using water proof sheeting in draw blankets and having the soiled ones boiled and washed.) Paralysis and catarrh of bladder also occurred. Treatment: chiefly quinine 10 grs. twice daily per rectum during the acute stages when he could not swallow it, later 5 grs. bis daily by mouth. The bed-sore got t. benzoin dressing. For the para-

lysed bladder I drew off urine and washed out bladder which soon recovered its tone.

November 28.—Distinctly better; now sits up to defæcate; urine is clearing; no rise temperature for some days and he sleeps well; but he is very weak and emaciated.

December 17.—Much better able to get about and is putting on some flesh and gaining strength. On December 12 I sent him from hospital (to make room for some severe fever cases). He has been taking quinine tonic for some time. I tried ol. morrhue and wine but they did not agree. His intellect is quite clear. Diet: in acute stage milk broth, sago and milk; later rice and milk to ordinary diet with milk extra.

December 5.—Arrived Georgetown, British Guiana. Has been making good progress; is bright and cheerful and had put on much flesh; not yet quite strong.

CASE 13. Tulsia.—First noticed afternoon of November 1. She showed symptoms of prostration and stupor in marked degree, and did not recover consciousness till 5th, when she answered questions; on that day too she seemed to suffer; she rolled to and fro moaning. I gave aperient at start and then quinine by rectum when she would not swallow; also gave brandy. On November 7 she was sinking. I then gave nutrient enemata (previously she had taken milk by mouth) but she sank, and at 11 a.m. of November 7 she died.

CASE 14. Chinkan.—At 7 p.m. on November 1 found him at my night inspection. The people about him said that he had got ill only that evening. Temperature was 103·8 degrees; recovered consciousness next day. Complained of much pain in head; pulse was fairly good. At 6 a.m. on 3rd I found him collapsed with fluttering pulse and cold clammy sweat. I gave brandy, but he died at 7.45 a.m. Treatment was aperient then quinine.

CASE 15. Chunkoo.—First noticed morning of November 3; then had temperature 104 degrees. The symptoms of stupor lasted for a short time only but there was much restlessness and excitement at times. Till November 9 he seemed getting on fairly well. On November 9 bladder was paralysed (necessitating catheterisation), and that evening he got suddenly worse, suffusion of lungs set in, and he died at 7.42 p.m. Treatment: I gave purgative, and then for a short time quinine. Then seeing poor results of treatment in other cases, and as he seemed to get on well I confined treatment to relieving symptoms as headache (for which morph. hypoderm. and antimony and opium acted fairly well—bromide in these cases seemed to have little or no effect), and getting him to take nourishment.

CASE 16. Abilakh.—First noticed on November 3. In this case there was much prostration at first, also much restlessness and pain in head. At first I gave quinine, then tried to relieve pain and restlessness by morph., which succeeded fairly well, and gave nourishment. At times brandy was given. On November 8 he began to show signs of failing, and on November 9 at 11.25 he died.

P.S.—With many of these I tried cold lotion to head but it had no apparent effect.

CASE 17. Randal.—First noticed on November 9

as having fever, headache and cough. There was little or no stupor in this case, but there was delirium, headache, retraction head, and pain at nape of neck. Treatment: chiefly quinine (about 20 grs. a day at first), sometimes brandy, and at times anti-pyrine for headache. Diet here as in other such cases was milk, broth.

November 28.—Still holding out, and looks as if he might recover. Has been quiet and can now sit up to food; very thin and weak.

December 6.—Moved from hospital to 'tween deck sick bay to make room for other patients in hospital. Has been making steady progress. Has been taking quinine tonic, wine.

December 16.—Getting stronger and putting on flesh; Intellect quite clear. Been getting nux vomica, wine, quinine, ordinary diet, and milk extra. Has some acne spots about groin and hands for which ordered washing and inunction of sulphur and oil.

January 5.—Arrived in Georgetown Harbour. He is much improved.

TROPICAL DYSENTERIES.—According to Dr. Stephen Long, dysentery in the Philippines presents five main types:—(1) The first type is *fulminating catarrhal dysentery*, a fatal form of dysentery running its course in four to eleven days and probably caused by Shiga's bacillus. (2) The second type is *simple acute dysentery* starting as a diarrhoea and frequently associated with malarial fever. (3) The third type—the *amœbic*—is divisible into four groups according to the nature of the active agent: (a) the *Amœba coli* is the commonest, the most persistent and the most serious of these, it is especially prone to cause liver abscess and to become chronic; (b) the *Trichomonas intestinalis*; (c) the *Cercomonas intestinalis*, frequently associated with streptococci; (d) the mixed type in which, besides the amœba, the *Bacillus pyocyaneus*, the *staphylococcus (aureus and albus)*, and the *streptococcus* are met with. (4) The fourth type, *chronic dysentery*. (5) The *gangrenous and diphtheritic* type, which is almost invariably fatal by perforation or toxæmia.

Dr. Long is of opinion that dysentery is an infectious disease carried by the food or drink. In regard to treatment, the main point is early attention to the disease. Sulphate of magnesia in one large or in several smaller doses during the day is especially commended. Calomel followed by Epsom salts is likewise beneficial. Ipecacuanha properly administered is a potent remedy. Subnitrate of bismuth in 40 to 60 grain doses has many advocates. Opium in the form of Dover's powder is a useful adjunct to bismuth. Enemata are occasionally serviceable, first to wash out the bowel with, and then as a medium of introducing medicaments such as tinct. ferri perchlor., 1 drachm to a pint of water, and peroxide of hydrogen. Milk should never be given unless diluted with rice water, barley water, or lime water.—*New York Med. Journ.*, March 30, 1901.

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THE

Journal of Tropical Medicine

MAY 1, 1901.

PRIZE ESSAYS ON SUBJECTS CONNECTED WITH TROPICAL DISEASES.

**For Conditions of Competition see page ii.
of Advertisement Sheet.**

THE interest at present taken in the amelioration of disease is fully borne out by the liberal way in which our public men support research. In connection with the diseases of warm climates the good done in this direction during recent years has been highly creditable to both the investigator and his supporters, and the need for a closer study of the ailments which afflict the native and render the life of the white man so precarious in the tropics, has come home to every one.

Through the liberality of two well-known public spirited men, Sir James Sivewright, K.C.M.G.,

one of our pioneers in South Africa, and the Hon. E. R. Belilios, C.M.G., of Hong Kong, we are privileged to offer two prizes in connection with this Journal. The donors of the prizes have expressed in general terms the subjects which they wished elucidated, and they have left it to us to declare the special points of most interest from a scientific and practical point of view. Sir James Sivewright has selected malaria, and after consultation with colleagues the question of the *duration of the latency of malaria after primary infection, as proved by tertian or quartan periodicity, or demonstration of the parasite in the blood*, seems a branch of the subject which it behoves us to specially inquire into. The choice of this subject for investigation allows medical men, both at home and abroad, to devote their energies to clearing up our hitherto indefinite knowledge of the latency of malarial infection, and should afford an opportunity for useful and eminently scientific work. Dr. Albert Plehn of the Cameroons, has published a book recently dealing with the immunity to, and the period of latency of, malaria, which we reviewed in our last issue (April 15). His work, although elaborate and comprehensive, by no means exhausts the subject, and we hope that practitioners who have the opportunity to study this interesting subject will take advantage of Sir James Sivewright's offer, and help to advance our knowledge in this direction.

The Hon. E. R. Belilios selected "plague" as the subject of his prize, and in conference with scientific workers on the subject, we have selected the all-important question of *the spread of plague by rat-fleas*. It is imperative that this question be cleared up speedily, and it is a point which admits of a definite conclusion. A few carefully conducted experiments by those who have the opportunity of studying this matter, will establish a fact and settle the question for all time. The judges selected will, we are sure, satisfy possible competitors. Than Surgeon-General Roe Hooper, C.S.I., President of the Medical Board, India Office ; Colonel Kenneth MacLeod, LL.D., Professor of Clinical and Military Medicine, Army Medical School, Netley, and Dr. Patrick Manson,

C.M.G., F.R.S., Medical Adviser Colonial Office and Crown Agents of Colonies, no more competent judges could be found. All papers sent in become the property of the JOURNAL OF TROPICAL MEDICINE, and will be published in the Journal as the Editors decide. We hope the donors of these prizes will be rewarded by an effective competition, and by real additions to our knowledge.

Translations.

KELOIDAL-FIBROMATA OF THE LOBE OF THE EAR IN THE NEGRO RACE.

By Drs. LE DANTEG AND BOYÉ.

(Translated from the French by P. Falcke.)

THE tendency of the negro race to develop connective tissue is a well-known fact, borne out by the frequent occurrence in negroes of fibromatous affections, such as rhino-scleroma, keloids and fibroids.

Various tribes utilise this peculiarity of the "black organism" in the production of connective tissue by instituting actual *cicatricial* tattooing. Negroes are frequently encountered in America, Africa and Oceania whose faces are covered with symmetrical, exuberant, linear scars which have been artificially induced by simply incising the skin. When the lobe of the ear is pierced for the reception of an ornament it sometimes becomes the seat of tumour, the nature of which, however, is by no means of a definite character. As these tumours appeared of some interest, we took the opportunity of studying their anatomical characters.

After laying the facts before our readers, we propose to discuss the true nature of these growths. The following case will serve as a type:—

Woman of about 25 years of age, suffering with symmetrical tumours of the lobe of the ear; these tumours in the Malinké dialect are called "*néri*." The patient's father was the subject of two similar tumours, but no other member of the family exhibited a like deformity. The affection commenced when the patient was about 5 years old, when, according to the national custom, the lobe of the right ear was pierced in order to insert a gold ring. A few days after the operation a tumour began to develop on the lobe of the ear; the tumour grew gradually, but without causing the least pain.

Three years ago the woman consulted the medical officer of the station of Kissidougou (French Soudan), who removed the tumour; another, however, quickly appeared on the same place, attaining a size considerably larger than the primary tumour. At about the same time this negress had the lobe of her left ear pierced, and a month after a new tumour formed at the seat of the operation.

At present the condition of the patient is as follows: General condition very good, no sign of leprosy. This woman, on various occasions, has had wounds on different parts of the body, but in none of

these did any tendency to the formation of tumours ensue.

Right Ear.—The lobe is replaced by a multi-lobated tumour, flattened like a biscuit and about 10 centimetres in diameter. The tumour is free from all adhesions behind the ear, but is united to the cheek (fig. 1, see plate).

Left Ear.—The tumour is appended to the lobe; it is composed of two small lobes about the size of pigeons' eggs; it is free from all adhesions, back and front; it is of a semi-soft, elastic consistency, and is covered by normal black skin (fig. 2, see plate).

The patient refuses every kind of surgical interference.

EXAMINATION OF THE TUMOUR.

Macroscopic Characteristics.—The tumour is tough and elastic; the surface is covered by seemingly normal black skin. On section it grates somewhat under the knife. The cut surface is greyish, and traversed in all directions by fibrous bands. No juice exudes when the cut surface is scraped.

Thin sections taken from the tumour were, after immersion in paraffin, stained and examined microscopically.

The tumour is homogeneous and composed of areolar tissue, in the interstices of which there are fibrils of smaller dimensions, but no sudorific or sebaceous glands, nor hair follicles, are to be seen anywhere. The papillæ of the derma are less prominent than in the normal condition, but nevertheless are quite distinct. The various layers of the epidermis are in their normal order; the deep layer is markedly pigmented.

Under a high power it is noted that, in contradistinction to the normal skin of the negro, there is no trace of pigment in the superficial layers of the dermis.

To sum up: the tumour is composed of pure connective tissue, which during development has destroyed all the normal constituents of the dermis—glands, hair follicles, and melanic pigment; the epidermis only has remained intact. One may conclude that the microscopic examination of the tumour demonstrates that it is a *fibroma*.

We have microscopically examined several other tumours of the lobe of the ear, kindly sent on to us by P. M. O. Gallay; in these the results obtained were the same.

What conclusion should one come to? Should these tumours be said to belong to the class of *keloids*, as their history and behaviour would seem to indicate? Or should they be described as *fibroids*, in accordance with their histological characters?

Let us successively examine the claims of each.

(1) *Keloids.*—The study of keloids has led to many discussions, but nearly all authors differentiate two varieties of keloids—the true or spontaneous keloid, and the *cicatricial* keloid. It is evident that here we have only to consider *cicatricial* keloids, as the tumours under consideration owed their origin to a wound.

One type of *cicatricial* keloid is furnished by the following observation of Trélat.¹ It is the case of a

¹ *Clinique chirurgicale*, p. 234.

negro, aged 21 years, who, as a result of a wound on his chin, observed that the cicatrix hypertrophied, forming a tumour about the size of the forefinger across the lip and chin. Trélat extirpated the cicatrix, but the disfigurement returned; at each point of suture a primary keloid formed, consisting of a small tumour showing *white* on the black skin.

Hardy¹ says that the keloid, be it spontaneous or the result of accident, is always exhibited as a limited tumour *projecting* 1 to 6 mm. above the level of the skin, variable in form and extent, but of rather firm and elastic consistency.

Finally, according to Cornil² keloids the result of wounds may be looked upon as malignant, exuberant cicatrices. They are characterised by protuberant bands, by rounded or radiating prominences, by their hardness and their smooth surface, covered by a thin, glandless hairless skin, by their colour, white or tinted by the little vessels which run over their surface.

It will be sufficient to glance at the annexed photographs (see plate) to become convinced that the tumours are not due to an exuberance of the scar itself. The skin over the cicatricial keloids is white even in the negro (Trélat's case), but here the entire skin that covers the tumour is black (normal). It is therefore impossible to apply the term *keloid* to this kind of tumour.

(2) *Fibromas*.—Cornil remarks: *In order that a tumour may be said to be a fibroma, it is not sufficient that it contains connective tissue, it must contain no other tissue, for fibromas are composed exclusively of connective tissue.*

We have noted above that in the sections we made in the tumours of the lobe of the ear, the neo-plastic portion was formed of connective tissue only. As the latter develops, all other elements disappear, even the melanin pigment. These tumours of ours must therefore be histologically classed as belonging to the fibromas, but as their origin is due to the consequences of a wound, we propose to call them keloidal fibromata; that is to say, tumours whose point of departure is from a cicatrix, but which are decidedly actual fibroids.

They are not, as it were, exuberant keloids such as the ordinary cicatricial keloids (fig. 3, see plate) but are suppressed or depressed keloids (fig. 4, see plate).

In conclusion, we must direct the attention of medical men to the frequent—sometimes even fatal—recurrences of consecutive tumours caused by ear piercing. To avoid these recurrences our advice is: (1) to radically extirpate the tumour; (2) to watch the cicatrix of the wound, in order to keep it down either by electricity or the use of the cautery (*fer rouge*).

It may even be necessary to combat the fibrogenous constitutional tendency of the negro race by a treatment of arsenic or iodide.

Correspondence.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

"GNATS AND MOSQUITOES."

DEAR SIR,—The entire edition of my recently published "Handbook" on the above subject has been sold out, and my publisher has telegraphed to me in India that a reprint to supply an urgent demand is necessary.

Our knowledge of the life history and habits of the malaria-carrying species is, however, growing so rapidly, that a mere reprint appears to me out of the question, at any rate, as regards the first or general part of the work.

To prevent disappointment will you kindly then permit me to state, through your columns, that a new issue, brought as far as may be up to date, will be ready in May.

Yours faithfully,

GEO. M. GILES,
Lt.-Col. I.M.S.

News and Notes.

INOCULATION IN TYPHOID.—The general opinion concerning inoculation against typhoid fever in South Africa appears to be: (1) that it is just possible protection is afforded for a few months; (2) that as a rule inoculation does not modify the course of typhoid; (3) that the incidence of typhoid is diminished is not proved; (4) that in view of the pain and inconvenience arising from inoculation the practical value is questionable.

INSTITUTE OF TROPICAL HYGIENE AT HAMBURG.—The authorities of the State of Hamburg have opened an institute for the study of tropical diseases, and the Imperial Government has contributed to the funds necessary for the building and endowment of of the Institute. Adjoining the Institute is a hospital of fifty beds devoted to the reception of patients suffering from tropical diseases. The city of Hamburg is to be congratulated upon the public spirit shown by its municipality, and in the interests of science in general and tropical pathology and therapeutics in particular, we hope and wish that the Institute will play a useful and beneficial part in the fight against malaria, dysentery, beri-beri, and other tropical scourges.

Current Literature.

DYSENTERY.

DYSENTERY IN SOUTH AFRICA.—Dr. Washbourne states that chronic constipation is frequent in South Africa due no doubt to the nature of the food available during a campaign. In some cases the accumulation of faeces gives rise to dysenteric symptoms, tenesmus, blood and mucus, and the ailment can only be distinguished from true dysentery by a careful inquiry into the history. Fortunately the treatment of each condition is the same, viz., purgatives and enemata.—*Brit. Med. Journ.*, April 20, 1901.

¹ Dict. Jaccoud, article on Keloids.

² "Histologie pathologique," p. 858.

EPIDEMIC JAUNDICE IN SOUTH AFRICA.—According to Dr. Washbourne, a large number of cases of jaundice occurred during January and February, 1901, in the Transvaal and Orange River Colony. The disease is ushered in by nausea, by vomiting, or pain in the neighbourhood of the right epigastrium. The temperature may remain normal or there may be moderate pyrexia; the tongue is covered by a white fur, and the bowels may be regular, loose, or constipated. The patient feels wretched and depressed for three or four days, when jaundice appears with clay-coloured stools. The jaundice speedily becomes intense, but in a few days it fades away and disappears. All the cases notified have recovered. The assumption is that the symptoms are due to an inflammation of the duodenum or caused by some infective agency. As many cases of similar illness have been observed without jaundice being present, it is assumed that the jaundice is only an accidental phenomenon.

A HYBRID OF TYPHOID FEVER AND DYSENTERY.—Dr. Paul Remlinger, Constantinople, states that clinical and pathological evidence go to prove that typhoid and dysentery may co-exist in the same patient. *Post mortem* the lesions of dysentery and typhoid are easily distinguishable, the former being confined to the small and the latter to the large intestine. The course of the temperature is the main clinical evidence of the presence of typhoid, although other symptoms such as headache, insomnia, &c., seem also to point to a typhoid rather than a simple dysenteric infection.—*Revue de Médecine*, March.

MALARIA.

ANTI-PERIODICS AND THE MALARIAL PARASITE.—Quinine, according to Lo Monaco and Panichi, appears to act directly on the malarial parasite and in one of two ways: (1) By destroying the parasite whilst in the red blood corpuscle; (2) by allowing the parasite to escape from the corpuscle into the blood plasma when it may be incorporated by phagocytes. The parasite in its first or early stage of development in highly resistant to the action of quinine, in the second stage of development the parasite is more readily destroyed by quinine during the febrile than during the apyretic period. The early administration of quinine appears to check or prevent altogether the third or segmentation stage of parasite life. As many persons recover from malaria without taking quinine, it is probable that in the blood or tissues anti-malarial materials are naturally present.—*Il. Policlin.*, February, 1901.

MALARIA AND TYPHOID.—Dr. T. W. Washbourne remarks:—"In one case, of which I have full notes, a well-marked attack of remittent malaria with parasites in the blood recurred during the incubation period of enteric fever."—*Brit. Med. Journ.*, April 20, 1901.

Dr. David Melville, in his report of 895 cases of typhoid in Ladysmith, five were of the "malarial" type; "the malarial element asserted itself" as the typhoid fever subsided. One case showed quotidian, another tertian, and a third the quartan type.—*Brit. Med. Journ.*, April 20, 1901.

ETIOLOGY OF MALARIA.—According to M. Vincente, other agents besides the mosquito are concerned in the propagation of malaria. Certain sporiferous parasites of the oleander are known to carry the infection. Agents of transmission coming from plants, especially those kept in hot houses, are also supposed by M. Vincente to possibly play a part in inoculating the human being with malaria. This suggestion is ingenious, but it requires to be substantiated by experimental proofs.—*Archiv. General de Med.*, March, 1901.

LEPROSY.

SHOULD LEPERS MARRY?—In a letter to the Editor of the *Medical Record*, April 6, 1901, Dr. A. S. Ashmead states that he does not think it advisable to allow lepers to marry, leprosy being a bacillary disease. At the same time, Dr. Ashmead holds that the heredity of lepers has not been proved, and that the surest and best means of extinguishing leprosy is to isolate and take out of the country as soon as born the progeny of lepers. "The greatest part of the cases of heredity indicated are simply cases of contagion." Dr. Ashmead accuses Great Britain of shipping hundreds of thousands of natives of India "more or less related to lepers" to Mauritius, Guiana, Trinidad, Jamaica, Africa, &c., and remarks that England justifies herself in this step "by an assumed belief in non-contagion." The last sentence of this Anglophobe physician informs us "that American physicians will always be found able to instruct Great Britain in the matter of her vast Indian leper problem." We are always glad to learn from American physicians, but we refuse to bring science and the advancement of knowledge to the low level of national limitation Dr. Ashmead would seem to hanker after.

MISCELLANEOUS.

GNATS OR MOSQUITOES.—That Lieut.-Col. G. M. Giles' carefully compiled and cleverly written book, "Gnats or Mosquitoes" has filled a distinct want, is proved by the fact that the first edition is entirely exhausted. We hear from Messrs. John Bale, Sons and Danielsson, the publishers, that a new edition is in course of preparation and will be published about June.

WHITE ANTS.—The damage done to property by white ants in Rhodesia, seems to be even greater than in India. It is no uncommon thing, says a writer, for the colonist, on returning from his day's labour, to find the coat he left hanging on a nail of his cottage wall and the books on the table absolutely destroyed by this tiny marauders. Nor is this all. "On awaking next morning, you are astonished to see in the dim light a cone-shaped object rising from the brick floor a short distance from your bed, with two holes on the top like the crater of a miniature volcano. Upon closer examination you discover that the holes have just the size and shape of the inside of your boots, which you incautiously left on the brick the night before. They have given form and proportion to an ant heap, and nothing is left of them except the nails, eyelets, and,

may be, part of the heels." And as the same dismal story—with variations—has to be told about every other article of apparel and all perishable objects, it must be admitted that there are drawbacks to the lot of a settler in Rhodesia.—*Indian Engineering*, February 23, 1901.

PRESCRIPTIONS.

INFANTILE DIARRHŒA :—

Lactic Acid	m30 to 45.
Syrup Quinces.. ..	℥i.
Distilled Water	℥iv.

A teaspoonful every two hours. Use the lactic acid in doses of 30 m in children less than one year old, and in doses of 45 m in those from one to two years of age.

ACUTE GASTRO-INTESTINAL CATARRH :—

Creosote	mxi.
Camph. Tinct. Opium ..	℥iv.
Bismuth Subnitrate ..	℥iii.
Pepsin (U.S.P.)	℥i.
Syrup Orange Peel	℥iii.
Peppermint Water.. ..	to make ℥iii.

Half a teaspoonful every two hours for a child of two years. Vary with the age and severity of the case.

INTESTINAL TORPOR :—

Tinct. Physostigma ..	} of each ℥ii.
Tinct. Nux Vomica ..	
Tinct. Belladonna ..	

Thirty drops in water, morning and evening.

CHRONIC CONSTIPATION :—

Ex. Cascara	} of each gr. ½
Aloin	
Oleoresin Ginger	
Ext. Belladonna	} of each gr. ¼
Podophyllin.. ..	
Strychnine	

One three times a day, or one or two at bedtime.

SEROUS DIARRHŒA OF NURSINGS :—

Atropine Sulphate	gr. ⅛
Distilled Water	m 450.

From one to three drops may be given, but the general condition must be closely watched, and three drops must not be exceeded.

DIARRHŒA AND DYSENTERY :—

Bismuth Subnitrate	℥iv.
Powd. Nutmeg	℥ii.
Powd. Chalk	℥ii.
Syrup Ginger	℥iii.

Shake the bottle. Teaspoonful after each movement of the bowels.

PALATABLE EFFERVESCENT QUININE :—

R Quinine sulphatis	℥i.
Acidi critici	℥iiss.
Syrupi aurantii corticis..	m xv.
Syrupi simplicis	m xv.
Aque destil. q.s.	ad. ℥v.

M. Sig. Add ten or twenty drops to two ounces of water containing five or six grains of sodium bicarbonate.

Ten drops of the mixture contains about one grain of quinine.—*Therapist*.

INFANTILE DIARRHŒA. — M. Grosch being very pleased with the results obtained by the administration of tincture of iodine for infectious gastro-enteritis, M. Cattaneo (*Semaine Médicale, Revue Mensuelle des Maladies d'Enfance*, March, 1901), has been using the same drug in the following form as a treatment for infantile diarrhœa with equally favourable results :—

R Tincture of iodine	from 10 to 15 minims.
Syrup	300m.
Distilled water	2,250m.

M. One drachm every two hours.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Medec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Exercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
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Revista de Medicina Tropical.
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The Medical and Surgical Review of Reviews.
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2.—Manuscripts sent in cannot be returned.

3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

5.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Editors.

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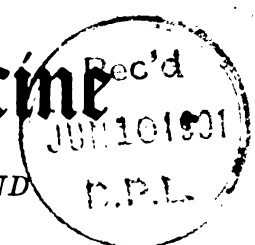
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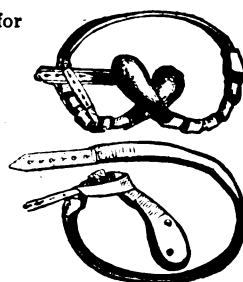
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SPLENIC abscess of malarial origin is rare, so rare as to be deemed sufficient warrant for placing the following cases on record. The absence of any of the ordinary causes of this condition, usually some general infective process (notably ulcerative endocarditis) could in every case be clearly demonstrated, while *per contra*, the outstanding history of malaria with splenic tumour, reduces any question of etiology to very narrow limits. The first two cases occurred years before malaria had assumed place as a microscopic entity, the latter two were verified in the usual way.

To those who have watched the state of engorgement of the spleen during the cold stage of a chronic malaria (that organ behaving like an erectile tissue) the question must frequently have arisen as to why that process did not oftener overstep the limits of a congestion, and become a true inflammation. Nor is this question by any means answered by reference to the *post-mortem* table—rather the contrary.

In the large spleen of chronic malaria it is usual to find large tracts of softening consisting of the *débris* of splenic tissue and blood cells deeply melanosed (tarry foci), the line of delimitation of which from abscess formation must be very narrow indeed.

Besides the clinical interest attachable to the varied routes of evacuation, three points in the mass of symptoms may be selected for fuller consideration. These are: (1) pain in the spleen, (2) the intensity of the rigors, and (3) the nature of the discharge.

Pain in the abdomen is not an uncommon symptom in the cold stage of uncomplicated malaria, passing off as the hot stage asserts itself. It may be general, or localised over the spleen; but when this pain is of

such severity as to be made a prominent complaint, it is, in my opinion, a valuable indication that the extent of local implication is out of proportion to the severity of the general disease, and ought, in addition to general treatment, to be met by energetic local measures.

Pain in the spleen was a prominent symptom in the first three of my cases. If, as has been asserted, the spleen is an insensitive organ, the occurrence of pain can only be explained by assuming it to be due to an accompanying peri-splenitis. Colour is given to this view by the fact that in my second case the adhesions, as demonstrated *post mortem*, were large and extensive; while in the other cases the amount of peri-inflammation must have been considerable to admit of evacuation of the abscess through either of the routes followed.

Then as to the second point, the intensity of the rigor, the evidence of three cases is unequivocal. To a mind familiarised with, and blunted by, a daily recurrence of the ague rigor, that of splenic abscess must be of extraordinary severity to cause it to assume the prominent place it occupied in the consciousness of those sufferers. Even in the fourth case, the absence of any special mention of this point can only be taken as neutral, not negative, evidence, as imperfection in language, it is to be feared, may have led to imperfection in detail in the record of symptoms.

To raise the third point, viz., the nature of the discharge, to the status of a diagnostic may be, by some, looked upon as a dubious refinement. The amount of discharge in Case 1 was too small in quantity to admit of its bearing any pathognomic significance, but the profuse expectoration in Case 2 was at once recognised as being something totally different from that usually obtained through the respiratory tract, let its source be what it may; and the discharge from Cases 3 and 4 being of so exactly similar a nature, justifies me in placing some weight on its distinctions.

Never in any of my cases, nor at any time in the process of evacuation, was the pus of a consistent

creamy nature. It was of a pearly-white colour, occurring in large semi-translucent masses or clots, resembling, if an analogy may be pardoned, nothing so much as asbestos or glass wool in a vehicle of some viscid colourless substance like glycerine. As evacuation progressed the discharge became thinner, resembling serum carrying with it those dense woolly clots. The distinguishing points are thus briefly: the want of homogeneity in the discharge, and the pearly-white almost fibrous appearance of its more solid constituents.

CASE 1. Rupture externally, Sinus: Recovery.—A large, powerfully built Chinaman of the Kheh tribe, the headman at the tin mines in the Malay Peninsula, came for advice regarding a discharging sore in his abdominal wall. The history obtainable was of the slightest; that of much shivering and fever, the former of which seemed to have left a much more vivid impression on his memory than the latter. Subsequently a large swelling had formed in his abdomen, and after becoming painful, had burst through the opening shown. The opening was circular, about the size of a sixpence, with red pouting granulations practically filling it up. Serum was being discharged in quantity sufficient to soak a dressing of several thicknesses of lint in a few hours, and the orifice frequently became blocked by thick clots of pus, causing great discomfort. It was situated at the outer border of the left rectus abdominis, and two and a half inches above the level of the umbilicus. A probe passed in a direction roughly parallel to the costal margin was productive of the discharge of some drops of blood containing splenic cells. The after-treatment was unimportant in detail and ended in closure of the sinus and restoration to health.

CASE 2. Spontaneous evacuation through the left Lung: Death.—European, male, aged 48, who, blessed, or in view of the life he had led, cursed, by the possession of a living competency, had been a wanderer during some twenty years, in almost every country in Asia, from Persia to Japan, and had lived hard throughout, came first under observation in 1891, for repeated attacks of malarial fever, which he had suffered from for many years. His history was uneventful, being chiefly that of a malaria of quotidian type. There was no history of syphilis, but a very pronounced one of alcoholism. Originally of powerful physique, the combined effects of malaria and his mode of life had reduced him to a fleshless anæmic wreck. The lungs and kidneys were healthy as was also the heart, although, as was to be expected, a "bruit de diable" was audible over every area. The liver was large and hard (indurated liver), and projected two fingers-breadths below the ribs. The spleen was very large, filling the left side of the abdomen down to the iliac crest and extending beyond the middle line laterally. After three weeks of fever he became convalescent and disappeared. In March, 1892, he again came under observation. To a night's exposure to the heavy dew of the tropics, following a prolonged debauch, fever was but a natural consequence. A few days' observation sufficed to show marked points of divergence from his previous attacks; the rigors were more intense and prolonged (still being daily and keeping roughly to their usual hour), the hot stage was shorter

in duration and more rapidly followed by a drenching sweat, and each rigor was accompanied by an intense pain in the left side. On these points of distinction, as well as the fact that he was being most inadequately nursed, it was deemed best to send him to hospital under the care of Dr. J. T. Leask, to whom I am indebted for the liberty to follow the progress of the case as well as for free access to the charts and notes. For nearly two weeks his history was such as has been indicated, then he suddenly began to expectorate quantities of thick flocculent pus, and simultaneously with this lost his rigors and seemed to rally for a day or two. The improvement, was, however, evanescent, the expectoration continued profuse, with moist rales over all the left lung, hectic fever came on, and he died exhausted in ten days.

Post mortem.—The spleen was found to be a mere husk, a fibrous bag, containing a quantity of the same thick, pearly-white flocculent pus as had been expectorated. It was adherent by its upper margin to the diaphragm, which, as well as the left lung, it had perforated. The lung was full of pus, and there were signs of breaking down of the lung tissue itself. The liver was enlarged, dense, and microscopically showed great increase of fibrous tissue. The heart and right lung were minutely examined, but neither in them nor in any of the other organs were any morbid appearances found.

CASE 3. Rupture and discharge through the Bowel: Recovery.—The patient was a Spanish half-caste, aged 33, who first came under observation in 1894. He was of small but wiry physique, and with the exception of malaria, had had no illnesses which he could remember. For many years he had filled the post of overseer on a sugar estate in the Philippines, and had there contracted malaria. After coming to Singapore the attacks became less frequent, though not less severe, and for a period of two years he sought advice at intervals on their account. Each attack lasted from eight to ten days, was exceptionally sharp, and, as in the foregoing case, of quotidian type. Beyond a considerable splenic enlargement, no evidence of other disease was found anywhere.

He was lost sight of for several months, till one night some of his friends called me to see him, stating him to be very ill. I found him comatose and pulseless, and believing him moribund, hesitated to make any very minute examination. A cursory glance, however, showed his abdomen to be practically filled by the enormously enlarged spleen. Though convinced of its futility I agreed to see him in the morning, and when I called was surprised to find him not only alive but decidedly better. His friends informed me that he had, during the night, passed several large stools under him. The last one they had kept and I had no difficulty in recognising it to be pus of the peculiar nature of that which I had seen in the previous case. The abdominal tumour had in no great measure subsided. Beyond careful feeding and scrupulous attention to cleanliness there was no interference with the course of nature, and to cut a long story short, he was able to be about again in six weeks. His own account of his illness was that the fever had become more severe, with daily

recurrences of the rigors, which were prolonged and intense. Latterly they had occurred several times in the day, with sharp pain over the spleen, but he remembers only a day or two of this before losing consciousness.

There now remains a firm mass about the size of a clenched fist in the splenic region, extending from the upper border of the tenth rib to the iliac crest vertically and laterally, from one inch external to the border of the erector spinæ behind to the line of the an. sup. iliac spine in front. This mass admits of only a limited movement. His general condition is good, his blood count over four millions, there is no leucocytosis and the malarial plasmodium may be got in specimens taken at appropriate periods, as fever yet recurs, though in a much modified form.

CASE 4. Operation: Recovery.—In November last I was called to see a tall, large-boned Arab. Little information could be elicited beyond the fact that he had resided for many years in one of the most malarious districts in Sumatra, and had always suffered from fever. The enlarged abdomen he had been cognisant of for the last two years. He was extremely ill, emaciated to the last degree, with a temperature of 104.6° and cold extremities. His abdomen was entirely filled on the left side by a tense swelling which extended two inches to the right of the umbilicus and reached the iliac spine on that side. Posteriorly, in the left quadratic space, there was an area of fluctuation the size of the palm of the hand.

The same afternoon, in consultation with my colleague, Dr. James Kirk, an exploratory puncture in this area was made and pus got at no great depth. It was also decided to use a local, in preference to a general, anæsthetic, in view of the exhausted condition of the patient. Next morning, under ethyl chloride, the abscess was freely opened and drained with a rapid diminution in the size of the abdominal tumour and improvement in the patient's condition. His temperature fell to normal and remained so throughout. No information could be got from digital exploration, the finger entering a cavity, and beyond encountering a few stringy cords, it failed to meet a boundary wall in any direction. After draining for three weeks a probe still entered in a direction directly downwards and forwards to a depth of four and a-half inches. For five weeks the tube was retained, being occasionally shortened, and large quantities of the peculiar flocculent pus discharged. Latterly only a thin serum with an occasional flake of pus came away, becoming gradually less until in nine weeks from the time of operation it had quite ceased and the external wound closed. He had in the meantime so much improved in condition as to be scarcely recognisable, and he left for Arabia before I got a final opportunity of examining his abdomen and blood.

NOTES ON INDIAN MOSQUITOES.

By LIEUT.-COL. G. M. GILES, M.B., F.R.C.S., I.M.S.

Sanitary Commissioner, N.W.P. and Oudh.

(Forwarded for publication by F. V. Theobald.)

LANDING in Bombay in the month of March, I found that mosquitoes were not then particularly troublesome there. Still curtains were a necessity at night, and although I could find no *Anopheles*, *Culex teniatus*,* Meig., and *C. fatigans*, Wied., were pretty common. It was evident that both bred in small domestic collections of water, as the ornamental pond in the Hotel garden contained no larvæ. Leaving Bombay, I arrived in Lucknow on March 19. No rain had fallen for months, and the place appeared as if burnt up after the long drought. Not a single natural collection of water could be seen; all the irregular excavations, so common in India, and which usually retain a little water throughout the year, being absolutely dried up. In spite of this the houses in the Civil lines were simply infested with mosquitoes, which were so numerous as to be a veritable pest, of which every one was complaining, though no one appeared the least disposed to make any effort to destroy them. The reason for this enormous multiplication of mosquitoes was not difficult to discover. In Lucknow, as in the European quarters of most Indian towns, every house has its garden which can only be maintained by irrigation effected by means of small masonry channels carried from the well to all parts of the garden. At intervals these channels are interrupted by small tanks of cemented brick work, never of large size, and in fact, generally about a cubic yard in capacity. The object of these tanks is to store up the water in convenient places, so that the gardener may be able to dip from them and water his plants without even having to walk more than a few yards. There must be hundreds of these little tanks in the "Civil lines," and without exception they were simply alive with the larvæ and pupæ of *Culex fatigans*, no other species being, as far as my observation went, present at this time of the year. Under these circumstances it is not surprising that the lives of the inhabitants of the bungalows were made a burden to them, and that when I woke up the first morning of my stay, not having been able to find a mosquito net, I counted no less than forty punctures in about a square inch of the skin of my forearm. Now it would be perfectly easy for the good folks of Lucknow to practically rid themselves of the annoyance at this time of the year, for with the exception of these irrigating tanks there was absolutely not a drop of water to be found for a gnat to breed in, and it is obvious that if the inhabitants insisted on the tanks being completely emptied and cleaned out once a week, not a single mosquito could reach maturity; while the mature insects in the bungalows could easily be destroyed by the expenditure of a little trouble, as thorough fumigation with sulphurous acid, used in the same way as for disinfection, would destroy every insect

* *Culex teniatus*, Wiedemann, is synonymous with *Culex fasciatus* of Fabricius. It comes in my new genus *Stegomyia*. —F. V. T.

in the house. For this fact I am indebted to Mr. Hankin, the well-known bacteriologist, who discovered the fact in the course of some experiments he was making with the view to utilising sulphur for disinfection of plague-infected dwellings.

The sulphur should be mixed with about one-eighth its weight each of nitre and charcoal, and moulded with gum water into pastilles weighing about 4 ounces; each of which, when burned, will supply sufficient sulphurous acid to render about 1,000 cubic feet of air lethal. It is almost needless to say that before setting fire to the pastilles all doors and windows should be closed, and the rooms treated exactly in the same way as if one were "fumigating" them for some infection. If, however, people would but insist on all domestic stores of water, such as those irrigation tanks, being emptied weekly throughout the cold season, there would be no need to deal with the adult insects, as in the absence of any breeding places the race would soon die out for want of progeny, and only stray stragglers from the distant bazaars could come to trouble the European community. But this would require co-operation, and to secure this is hard, for it is well nigh impossible to convince the even very well educated "man in the street" that there can be any connection between the prevalence of mosquitoes and the cultivation of his cabbages.

The matter, however, is of far-reaching importance as, in spite of the well-known pictures of the anopheles pool, I find that these tanks are, at the proper season, undoubtedly the favourite breeding places of *Anopheles*.

On moving into my official quarters in the Macchi Bhawan, which form part of the remains of an old fort destroyed after the mutiny, and are placed on a mound in the midst of an arid plain, I found the rooms to be almost free from mosquitoes, although the well-irrigated Husseinabad gardens are within 400 yards of the site. Still a certain number made their way across the intervening space, so that when sleeping in the open one required a mosquito net. By insulating, however, on the chicks (insect-proof screens made of split bamboo) being let down from dawn to 8 a.m., I kept the house comfortably free.

Shelter during the heat of the day is, in fact, a matter of life and death to a mosquito. About the only way to sleep in comfort at this time of the year in Oudh is to have one's bed placed in the open.

My servant one night was careless in the tucking in of the mosquito net, and when I woke in the morning I found I should have done well to have imitated the Irishman of the story and "crept out under the bottom bar," for the net was alive with happy, satiated dames of the gnat community.

My bed, as a matter of fact, had no bottom bar, but doing my best to imitate the astute Hibernian, I crept out with infinite precaution, tucked in the curtains, and gave directions that the bed should be left where it was. The day turned out somewhat cloudy, the temperature inside the net never exceeding 105 degrees F., but by noon every mosquito was not only dead but bone-dry.

Until the middle of April no other species than *C. fatigans* appeared, but towards the end of the

month my quarters were suddenly invaded by a swarm of *Anopheles Rossii mihi*. After some search I found their breeding pool some 300 yards off, beside one of the piers of the old bridge across the Goomti, which flows just beneath the house. The pool was but a few yards long by not more than six feet wide, and though it did contain a certain amount of green filamentous vegetation, was extremely foul. Still it is the nearest approach to the "*Anopheles* pool" of the West African Malaria Commission that I have met with inhabited by the larvæ. Typical pools of the sort I have indeed come across by the dozen, but in no case have I met with the larvæ in such pools.

The horizontal posture of the larvæ was however very noticeable, and when placed in a tray under lens, I could also verify their peculiar trick of screwing round their heads so as to look upward.

I bred out adult insects from these larvæ and also confined some females over a dish of water from the pool, but I could not induce them to deposit their eggs; and then a plague scare called me away, and when I returned no *Anopheles* could be found in the house, and the pool (which I had kerosined) contained no larvæ.

In May my office moved to the pleasant hill station of Naini Tal, some 7,000 feet above the sea. When I arrived, mosquitoes were very scarce, but we had an abnormal amount of rain for that season of the year, and soon they began to appear in small numbers. The first species I took is one I had last year received from Bakloh in the Punjab Himalayas, and which I then thought might be identical with *C. albopictus*, Skuse; but about the same time I received a specimen of the latter species from Travancore, and there can be no doubt that they are distinct. The decoration of the thorax closely resembles that of *C. taniatus* and of *C. notoscriptus*, Skuse, but the position of the tarsal bands distinguishes it from both, and the venation of the wing does not answer to Skuse's description, so I accordingly describe it as *C. pseudotaniatus* sp. n. For some time I could not discover the breeding pool of the local mosquito, but ultimately I found that the larvæ inhabit certain pools in the course of the surface drainage system. Even in moderate rain these pools are mere interruptions in the course of a roaring torrent, and it is difficult to understand how any *Culex* larvæ can maintain itself in such a position; nevertheless there they may be found, even immediately after the heaviest rain.

Taking the larvæ from these pools I bred out two additional new species, *C. pulchriverter* and *C. viridiventer*. The former is a very beautiful and well-defined species, but the latter closely resembles *C. fatigans*, Wied., but is certainly distinct, as it is unlikely that any domestic gnat could maintain itself in such a situation, and it differs radically from *C. fatigans* in habits of life, for both this and *pulchriverter* are purely phytophagous, sylvan species; as, though I liberated a number in my sleeping room, none ever attacked me, and they seemed to die for want of vegetable food. Moreover, except by accident, they never enter houses.

In the fresh insect, however, there is no difficulty

in distinguishing the species from each other at a glance by the form of the light abdominal bands which are distinctly triangular in well-marked specimens of *C. viridiventer*. The most striking point of my observations in the hills is the occurrence of several species hitherto believed to be restricted to Europe. In my "Hand-book of the Gnats" I have already mentioned receiving *C. annulatus*, Schrank, from Bakloh . . . , but on this occasion I also met with Noe's recently but very inadequately described *C. mimeticus*, and also *C. spathipalpis*, Rond., besides a species I took to be *C. pipiens*, L., but which I understand from Mr. Theobald he believes to be distinct. As there is continuous temperate land connection between Europe and the Himalayas, there is nothing astonishing in this, and I look to hearing of the discovery of other European forms in these mountains.

In July, a day or two before returning to the plains, I took in my bungalow a single female of *An. Lindesayii mihî*, but have since met with no other examples, and I have not been able to discover its breeding pools. Probably like *An. Rossii mihî* of the plains, it frequents small domestic collections of water, but in Naini Tal at least it is rare.

In July and August, my duties involved an extensive tour through the province during the rainy season. In the early part of the period it was evident that though *Anopheles* larvæ were common, they had not long been so, as even in places where they were plentiful, I could find no adults. It was not indeed till the end of the month that I began to find them at all commonly in bungalows. The situations, however, in which I found the larvæ entirely upset all the notions I had gathered from recent writings on the subject. I began, of course, by looking for the typical *Anopheles* pool of Ross, but such as I found never held any of the expected larvæ, and the first place I met with them was in the garden of the Meerut Club, in the small irrigation tanks I have already described. Here they were present in enormous numbers, sometimes alone, but more frequently in company, and apparently on excellent terms with the larvæ of *C. fatigans*. It was, however, noticeable that while the *Culex* larvæ for the most part remained in the middle of the tanks, those of *Anopheles* generally kept themselves floating with their heads touching its side walls, and so might easily be overlooked. In my subsequent wanderings, I met with *Anopheles* larvæ in a variety of situations, but always these small irrigation tanks were the "surest find," and further I never met with them at any distance from human habitations, so that I am inclined to suspect that females are unable to mature and deposit their eggs until they have had a feed of blood. I have also met with *Anopheles* larvæ in muddy pools of some size in brick fields, in the overflow from stand-posts in large cities supplied with a regular filtered water supply, and even in a very shallow depression in the concrete surface of the platform of a bustling railway junction, also fed by a stand-post. The establishment of the part played by the wastage from municipal water supplies in the propagation of malaria is a point of considerable importance, as it goes far to explain

the hitherto inexplicable fact that the introduction of a pure water supply into large towns in the N.W.P. has not, in any instance, been followed by any reduction of the mortality rate. As may be gathered from the foregoing notes, *Anopheles* appears to be capable of breeding in these latitudes during the greater part of the year, but the drying up of all suitable collections of water, and the fierce heat which renders any remaining collections of water luke-warm, brings the propagation of the species, under normal conditions, to a stand-still during the hot weather; but in shade of the narrow streets of an oriental city, with a constant flow of fresh cool water from the hydrant, the conditions of the rains are reproduced, in spite of the fiery heat; and the potentialities of malaria are prolonged for a good four months, with a corresponding enhancement of the malarial death rate that may more than neutralise the diminished amount of dysentery and other bowel diseases that must, without fail, result from the supply of pure water.

It is useless to seek for any confirmation of this theory in our mortality returns, as these, being unavoidably based entirely on the diagnosis of friends and village policemen, are, though fairly accurate as to total number, quite worthless in differentiating causes of death. One fact, however, they do establish, and that is that in our large towns which have been provided with supplies of pure filtered water, the hot weather, formerly by far the healthiest season of the year, no longer contrasts to the same extent with the autumn in the matter of mortality as heretofore, in cholera-free years; while the difference is as marked as ever in the surrounding country. The remedy obviously lies in good surface drainage, which at present is very defective, even in our largest cities.

The pools which may always be found in road-side ditches are another very favourite breeding-place for *Anopheles*. Some of the collections of water in which I have found them have been absurdly small, and would not suffice to fill a wash-hand basin. Far from being, as we have been led to expect, confined to a few marshy pools of moderate size, they are omnipresent, and seem to be capable of developing in water of very varying degrees of purity. *Anopheles Rossii* is, in fact, what Ficalbi would speak of as a "foveal" and not a "paludal" or even "sub-paludal" species. A consideration of these new facts makes it self-evident that the task of extirpating malaria by the systematic treatment of mosquito breeding-places with larvicides, is by no means as simple as we had hoped it might prove.

As every garden tank and each half-gallon puddle is a possible and probable breeding-place, it is obvious that it would require a small army of conservancy men, and an inquisitorial search of every corner, public and private, to secure the object aimed at. Still it must not be supposed that our knowledge is valueless and that nothing can be done. In cantonments, and in the European quarters of our municipalities (Civil lines) it would be practicable to enforce the weekly emptying of garden tanks and similar domestic water stores, and in such localities the systematic parafining of ditch and

other puddles would not be impracticable. For the individual European, living as he does in widely separated villas, there need be no difficulty in securing a very large degree of protection by a careful search of his compound and its immediate neighbourhood.

Now as to the question of the natural enemies of the larvæ. There is a general consensus of opinion that as a rule fish are inimical to the larvæ, and personally I have never met with fish and the larvæ of *Culicidæ* in company; so that it may be assumed that the majority of fish devour and destroy all that appear. This, however, is certainly not the case with all species of fish, for Captain James, I.M.S., finds them constantly in company in the rice swamps of Southern India. It is not to be expected that all species of fish should have the same tastes as to food, and the question is clearly entirely one of species, and it is quite possible that a good deal might be effected by the introduction of undoubtedly larvivorous species into such situations. I do not suggest this species for the purpose, but as an example I may mention that the ordinary golden carp, so common in ornamental tanks in Indian gardens, are so greedy of mosquito larvæ that they never allow them to survive in their company.

Another inveterate enemy is the larva of the dragon-fly, of which we have a great variety of species in India, all apparently equally destructive to the *Culicidæ*.

It is largely due to the well-nigh universal presence of these larvæ in all marshes and fairly sized collections of water in the open, that mosquito larvæ are seldom or never found in such situations. The presence of certain kinds of water plants is also inimical, mainly, I am inclined to think, because they hide the water from the female gnat searching for a suitable place in which to deposit her eggs. At any rate I can in no other way account for the curious fact that, in the Benares public gardens where there are some scores of the small irrigation tanks I have already described, *Culex* and *Anopheles* larvæ alone or in company were present in every tank save those that were covered with a peculiar floating water plant looking much like a young lettuce, which is spoken of by the natives as *Jalkumi*.

In the tanks so planted, the water was alive with young leeches and nematodes, but I could not find in any of them a single mosquito larva.

Introduced into a tank already containing mosquito larvæ however, the plants appeared to exercise no hostile influence whatever on their development, and for this reason I conclude that the plants act mechanically in the same way as an artificial cover.

During the rains, *C. fatigans*, Wied., ceases to be the prominent house-gnat that it is in the hot weather; its place being taken by *C. teniatus*, Meig., *C. albopictus*,† Skuse, and two others hitherto undescribed, species which I have named *C. gubernatoris* and *C. micropterus*; but it was not till late in August that I found *Anopheles* at all common in bungalows.

C. fatigans, Wied., is, I may in conclusion

remark a most puzzling species, and I am more and more at a loss to conclude as to what should be regarded as the type.

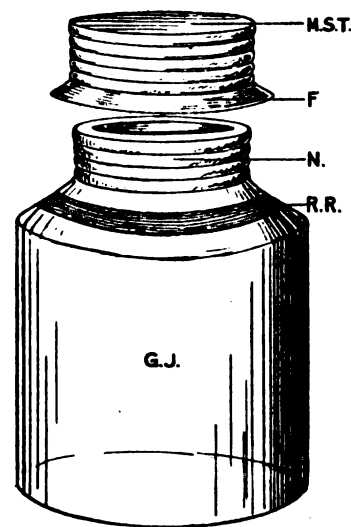
It would require very large series, coupled with careful examination of larvæ, to come to any definite conclusion in the matter; but I suspect that however close their superficial resemblance, there are really several perfectly distinct species of this type. As to one of these, which I have described as *C. viridiventer*, I have no practical doubt, as it contrasts in habits of food, and in the habitat of its larvæ, in every respect with *C. fatigans*, and is a purely Himalayan species. I suspect, too, that a form breeding in large cemented garden tanks in the plains during the rains is also distinct, but I have not yet been able to go sufficiently into the question.

A SIMPLE METHOD OF PRESERVING RUBBER ARTICLES IN THE TROPICS.

By W. E. DE KORTE, M.B.Lond., &c.

Graaff Reinet, Cape Colony.

I was much interested in Mr. Cantlie's lecture on "Surgery in the Tropics," reported in your issue of December last, and could fully appreciate his appropriate remarks on the many difficulties, one may almost say embarrassments, that beset a surgeon, or rather general specialist, for such a practitioner is in the tropics. "The period of perfection



N. is the neck of glass jar, G.J. R.R., a flat rubber ring. M.S.T., a metal screw-top having a flange, F.

of all rubber and caoutchouc instruments in tropical countries is," as Mr. Cantlie says, "short." After trying a good many dodges to prevent the deterioration of rubber out here, I have found that the following method, if carried out as prescribed, will materially prolong the life of rubber. All that is necessary is an ordinary glass jar with a well-fitting metal screw-top having a flange to it; a flat, perfectly sound rubber band, usually sold with the bottle. Such jars are easily obtainable, being much used for

† This is *Stegomyia scutellaris*, Walker.

preserving fruits. A convenient size of bottle is one about 12 inches in height, and about 8 inches in diameter. The size and shape of the bottle is of course unimportant, but it is desirable that it has a wide mouth to facilitate the introduction of articles and of the hand into its interior. The accompanying diagram explains the points about the vessel better than my description would. *Vide* drawing.

When the top is screwed tightly on to the neck of the bottle, the flange presses firmly on the rubber ring, the bottle is in consequence air-tight. The length of days of rubber preserved in such a vessel is proportionate to the number of times the jar is opened, *i.e.*, if the jar is not opened at all, the rubber will remain good for an indefinite period. As it is most essential that the vessel be air-tight, one must look well to the rubber bands. The best place to preserve them when not in use is the interior of the jar. It is of importance that as little kinking as possible should occur in packing the articles in the jar; it is also well to rub a little vaseline on the metal portions of apparatus it is intended to preserve, as bright metal loses its lustre in the jar.

A handy method of preserving catheters, bits of rubber tubing, &c., is to place them in an ordinary wide-mouthed glass-stoppered surgery bottle, in the hollow of the stopper of which some wet tow is placed. For articles in frequent use this is a preferable plan to the above-mentioned method.

CALF INOCULATION.

ABSTRACT OF LECTURE DELIVERED AT THE LONDON SCHOOL OF TROPICAL MEDICINE.

By LIEUT.-COL. RUNDLE, I.M.S.

HEALTHY calves, preferably female, of between one and two years of age (roughly judged by seeing that no tooth is shed) are selected. A day previous to the operation the abdomen of the calf from the umbilicus, and the inner and upper third of the thighs, is clean shaved. The lymph is inserted by "punctures" or "the line method"—scratches one and a half to two inches long, about one inch apart from one another. These punctures and lines are made as superficial as possible, and bleeding is avoided. In inoculating calves for the cultivation of vaccine only, punctures are used so that there may be as little irritation as possible; but for paste the "line method" is adopted. When it is difficult to obtain calves both punctures and lines are made on the same calf—the punctures being made around the teats or scrotum and over the perineum, and the lines are made over the rest of the abdomen and the inner surface of the thighs.

The calf from which the lymph is to be taken and the calf to be operated on are tied down on tables; a broad leather collar round the animal's neck and straps round the fore and hind legs will be found of assistance, as a strong healthy calf will often resist vigorously, and if only held on the table will sometimes free itself by a sudden kick or two.

For making the punctures a broad German lancet may be used, and the lymph inserted with the point of the same instrument.

The lines are made with an ordinary vaccinating or bleeding lancet, and the lymph well rubbed in by means of a flexible spatula. To prevent the calf from licking the abdomen a broad piece of clean cloth is placed round the abdomen and the broad leather collar is worn; if a couple of rings are attached on either side of this collar the animal can be tied up easily. From the fourth day after the operation the animal is examined morning and evening, and when the puncture vesicles are full and their contents clear, the lymph is transferred to other calves; and whenever the remaining vesicles have filled in, and before the lymph in them begins to turn turbid and the areola begins to form round them, they are gathered for paste.

The method is as follows:—The vesicles are first washed with soap (without antiseptics) and plenty of sterilised water at about 100 degrees F., and carefully and thoroughly cleaned one by one with a clean, thin, white towel soaked in water, and then covered with a wet towel to keep them soft. Wiping a few vesicles dry with a clean dry towel, the operator stretches one of them well between the thumb and index finger of his left hand; he then with a bleeding lancet—the point of which has been broken off and made blunt—scrapes off the vesicle clean with one gentle sweep of the instrument without drawing blood. The vesicles thus collected are received into the glass pan of an ordinary apothecary's pair of scales. After weighing transfer the mass to an agate mortar, and pulp well until the whole becomes a homogeneous mass. To this anhydrous neutral lanoline is added and well mixed up—six parts of lanoline to one of vaccine pulp.

The lanoline paste is issued in glazed earthenware pots or in amber-coloured glass tubes.

The average amount of lanoline vaccine got from a calf varies from quantities sufficient for 400 to 800 cases.

The inoculation of calves may be carried out (1) with supplies of bovine lymph obtained from the National Vaccine Institute; (2) with humanised lymph; (3) bovine scabs and humanised lymph, the scabs being pounded up in an agate mortar with glycerine.

Cowpox and horsepox are simple modifications of human smallpox.

The so-called vaccine is not an eruptive disease peculiar to the cow, but is produced by transmission of human smallpox to it, and man, not the cow, is the source of the disease.

The mild disease thus caused in the cow can by direct transmission from the cow to man produce in him a mild disease which gives protection against natural smallpox.

In 1883 Dr. Simpson, then of Aberdeen, obtained smallpox lymph from an unvaccinated female, (a) on the fifth day of the eruption, (b) on the sixth day of the eruption.

On November 11 he inoculated a cow on one teat with one scarification with lymph taken on the fifth day, and on another teat with two scarifications with lymph taken on the sixth day.

On November 17, the seventh day after, the single scarification yielded fifteen points; the two scarifica-

tions done with the sixth day lymph only became papular.

- Nov. 10. Small-pox virus obtained from J. P., aged 13.
- Nov. 11. Cow inoculated.
- Nov. 17. Fifteen points charged from vesicle and sent to Lamb's Conduit Street from Aberdeen.
- Nov. 21. Calf 938, aged 6 months, vaccinated.
- Nov. 26. Child Calf 941.
- Dec. 1. Child Calf 996.
Calf 948 Calf 947.

It is mentioned that the inoculation of *smallpox* on animals is a difficult matter, and only few succeed. Such, however, is not the case when animals are vaccinated with current, that is, human lymph.

There is no difficulty if lymph be taken on the eighth day from the "mother vesicle" of an inoculated human individual, but in England the law does not permit you to inoculate anyone with small-pox lymph.

ALCOHOLISM ON BOARD SHIP AND HYPERPYREXIA.

By DR. J. A. MACKENZIE.

THE following cases forcibly illustrated the effect of allowing alcohol to be issued to passengers addicted to drink on board ship.

Dr. J. A. Mackenzie, during voyages between the West Coast of Africa and England, reports that a first class passenger died on board the "outward-bound" steamer to which he was surgeon, in January, 1901, of acute alcoholism and uræmia. On the homeward passage in the same steamer, C. R., a second class passenger, a miner, died of hyperpyrexia from the effects of alcohol, plus malarial infection.

C. R. had been working upon some gold mines up-country for eighteen months, this being his second tour of service. He had repeated attacks of "fever" and had been a heavy drinker.

SUMMARY OF SYMPTOMS.

February 20.—2 p.m., temperature 102 degrees; hot limejuice, quinine grs. 20. 5 p.m., temperature 103 degrees; haust. nig. 1½ ozs. 7 p.m., temperature 103·8 degrees; phenacetin, grs. 5. 10 p.m., temperature 105 degrees; phenacetin, grs. 6. 12 midnight, temperature 105·6 degrees. Bowels acted freely and he took a breakfast cupful of thin arrowroot.

February 21.—4 a.m., temperature 102 degrees. 8.30 a.m., temperature 100 degrees. 12 noon, temperature 99 degrees. 7 p.m., temperature 98·6 degrees. During day had two 5-grain doses of

quinine, and took both arrowroot and bovril in fair quantity.

February 22.—Temperature remained normal, and patient went out upon deck for a few hours under the awning. Took some light food. Two 4-grain doses of quinine.

February 23.—Temperature remained normal. Patient took a fair quantity of food and expressed himself well. One 5-grain dose of quinine.

February 24.—Procured through his friend a bottle of whisky, of which, I am given to understand, he consumed the major portion. He remained upon deck late, contrary to my advice. Called to see him at 12 midnight. Temperature 106 degrees; phenacetin grs. 6; severe vomiting; enema quinine, grs. 30.

February 25.—1 a.m., temperature 107 degrees; cold pack. 2 a.m., temperature 108 degrees. 3.15 a.m., temperature 109 degrees; died. Temperature rose to 110 degrees half an hour after death.

Dr. Mackenzie adds that a week before joining this ship the patient, with two fellow-workmen, walked thirty-two miles through the bush down to Axim, where one of his companions died suddenly from "fever."

MULTIPLE LIVER ABSCESS DUE TO ASCARIS LUMBRICOIDES.

By J. C. THOMSON,
Hong Kong.

THE body of a Chinese female child, about eight years of age, recently found by the police at Hunghom, a village in British territory opposite to Hong Kong, showed a condition due to the presence of *ascaris lumbricoides*, which is fortunately uncommon. I found the liver greatly enlarged, and riddled into small abscesses, varying in size from a mere point of pus to cavities of an inch in diameter. In the larger cavities and throughout the liver-ducts there were numerous round worms, which had, by the irritation of their presence and by blocking the bile-ducts, caused the multiple abscesses. The intestine was packed with the parasites, and the stomach contained a mass of them as large as a man's fist. The body was much emaciated, but the organs were otherwise quite healthy.

THE DISTRIBUTION OF ANOPHELES IN ELLICHPUR CANTONMENT, STATE OF BERAR, INDIA.—Dr. W. Glen Liston, Capt. I.M.S., in the *Indian Medical Gazette* of April, 1901, states that when adult *Anopheles* mosquitoes are most abundant, viz., in September, October and November, malarial fever is most prevalent; and that coincidently with the diminution in the number of cases of malaria there is a decrease in the number of both the breeding-places and the adult *Anopheles*.



KELOID.

From a photograph sent by Dr. CRAN, Belize, British Honduras.

See page 171.

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THE

Journal of Tropical Medicine

MAY 15, 1901.

THE GEOGRAPHICAL DISTRIBUTION OF SURGICAL AILMENTS.

WE are so engrossed in what we might term the purely medical aspect of diseases in warm climates, that there seems but little attention being paid in these regions to the study of diseases of a surgical nature. We know that there are several diseases which relax, and several which increase, in virulence as the tropics are approached; and others again, such as plague, which appears to find its most favourable nidus on the sub-tropical borders, for in both the equatorial and in the temperate regions it has failed in modern times to flourish. Many other diseases, such as measles, scarlet fever, rheumatic fever, leprosy, yellow fever, beri-beri, cholera, &c., are modified, diminished or increased according to what appears to be climatic influences, but whether this is the real explanation or not is perhaps an

open question. Literature is rich, though certainly not yet nearly rich enough, in facts appertaining to the geographical distribution of "medical" ailments; but our surgical records as regards warm climates are blank indeed. Not that we do not hear of this or that major operation from time to time; but surgery is more than cutting, and surgical ailments ought to be studied from more points than that of operation merely. Yet it is only of operations we hear, of so many lithotomies or lithotrities, of the size of a scrotal tumour removed, &c., &c.; all useful in their way, but such contributions, although they add something to the art, do but little for the science of surgery. If surgery is to retain its position as a science, the basis must be on a wider and surer foundation than merely recording the surgical fashion of the moment.

We would urge on our readers, therefore, to collate and record their experience of surgical as well as of medical ailments. The field is large enough to satisfy any one, and important enough to justify the short time and the infinitesimal trouble necessary to produce useful work. There is nothing intricate or prohibitive in gaining the surgical knowledge wanted.

A mere statement of cases observed in daily work, whether in hospital or in private, is all that is necessary, and nothing is too insignificant to be recorded: for instance, what tumours of a malignant or non-malignant character seem to prevail in a district; or is the absence of growths, whether malignant or benign, conspicuous. A negative statement is as valuable as a positive, for without it geographical knowledge of disease is impossible. Again, is hare-lip or other congenital deformities common, uncommon, or unknown in your practice? Is hernia a common complaint; are varicose veins often seen; are piles, ischio-rectal abscess, fistula, rectal cancer, &c., surgical ailments of common or rare occurrence? Is appendicitis a disease seen in natives to any extent? We know little or nothing about the geographical distribution of rickets, uterine tumours, tubercular diseases of lymphatic glands, of the testicle, of bones, &c. These queries might be multiplied to include the whole of the diseases

of surgery, and profitably so, and information should include all and every surgical case of whatever nature.

Such questions as the origin and composition of urinary calculi, and of gall stones, although partially known and investigated, have only been really touched upon.

Dr. Campbell Highet, of Bangkok, sent a most admirable account of the eye diseases met with in his practice to this Journal on March 1, 1901. This article might serve as a type to go by for general surgical ailments. From such an article a definite idea of the eye diseases of a district, as distinct from eye operations and isolated cases of more or less unique nature, is obtained. The absence or presence—in other words, the geographical distribution—of disease upon the broadest basis is procurable only by each practitioner stating his individual experiences. By such a gathering of information a useful compendium and a great accession to our knowledge, practical, scientific and historical, would result. Work in this field is simple in the extreme; it necessitates no time spent in a bacteriological laboratory, no prolonged staining of tissues or microscopic investigations. It is a field open to every practitioner, and by joining in it the medical man will gain information which will probably astonish himself by its extent, and will certainly add immensely to our knowledge of surgical ailments in warm climates.

Translations.

A NOTE ON REMITTENT CLIMATIC FEVER IN THE FRENCH FLEET OFF BIZERTA.

By Dr. VALMYRE.

(Translated from the French by P. Falcke).

ON November 7, 1900, I sent four samples of water from the Baie sans Nom to the laboratory of the Pasteur Institute at Tunis to be analysed.

Sample I. was taken from the well of the Café Ernest; sample II. from a jar with a capacity of 150 litres from the Café du Gaulois; sample III. from the Fleet; and sample IV. from the cistern of the Café Muller.

This measure was adopted in consequence of a

number of our marines having been taken to the Military Hospital suffering with typhoid fever.

On November 17 the laboratory assistant sent me the analysis of the samples of water.

The report says: "Sample III. is drinkable from a bacteriological point of view; as to the three other samples, though the presence of Eberth's bacillus is not confirmed by analysis, bacilli coli abound. There are therefore grounds for regarding these waters with grave suspicion in normal times and for forbidding their use in times of epidemics unless first boiled and subsequently aerated."

The point that struck me on reading this report was the fact that we had patients suffering with typhoid fever on the Fleet, where the water is drinkable from a bacteriological point of view, whilst there were no cases of illness in the cafés in the vicinity, the waters of which are "very suspicious."

The question is, How to explain this contradiction between the analysis and facts? Have all the men admitted to the Military Hospital for typhoid fever really had this illness?

There were eight men, Van—, Mim—, Morz—, Pa—, Cha—, Lo—, Laf—, and No. 29, native.

First of all I eliminate Laf—, a stoker from *la Flèche* who had not been ashore for two months, and who is a case outside the Fleet.

Next I must eliminate No. 29, native, who about this time was discharged from the hospital, his diagnosis being gastric disorder.

After an attentive study of the clinical sheets of the six other patients, enquiry of the doctor in charge, and the assistants of the ward of the Military Hospital, and personal observation, I have come to the conclusion that Lo—, and Mim— only have had typhoid fever, while Van—, Morz—, Cha—, Pa—, and the other patients treated at the Infirmary at *la Baie sans Nom*, Et—, Cha—, Han—, Pie—, Ker—, have had an affection specially characterised by a prodromal period, a period of pyrexia with high temperature, absolute insomnia, constipation or diarrhoea, then a period of apyrexia, temperature of about 37° C., with a remission of all the symptoms, finally a new feverish period of short duration, which is followed by convalescence, the whole course of the illness lasting between fifteen and thirty days.

The following table exhibits the course of this affection:—

NAMES	DAYS		
	Pyrexia	Apyrexia	Pyrexia
Pa	10	12	7
Van	7	2	5
Morz	15	16	2
Cham	14	3	1
Han	9	6	2
Etch	5	3	4
Char	12	2	5
Pier	10	8	3
Kerd	13	2	2

The course of the illness was as follows: a prodromal period of some days, during which the patient feels discomfort, insomnia, want of appetite, lassitude,

diarrhœa or constipation. When the patient comes to be treated, he exhibits a temperature of from 38° to 40° C., the symptoms enumerated above then become intensified, the eyes are bright, the face pale, the abdomen exhibits no peculiarity except some rumbling, the temperature remains high during a period of from five to fifteen days.

Sometimes the temperature falls to 36.5° C., generally, however, the average is about 37° C. This period of apyrexia lasts from two to sixteen days; then without any apparent predisposing cause such as food, &c., the temperature again rises suddenly for five or at most six days, and then convalescence begins.

The following conditions are observed simultaneously with the fever:—

Digestive Organs.—The tongue is furred down the centre, the sides being reddened, some vomiting at the commencement, also constipation, or diarrhœa with ochre-coloured stools, of a fœtid odour; transient congestion of the liver, little or no abdominal flatulence; some rumbling in the right iliac fossa, pressure on which is not attended with pain; there were never involuntary evacuations.

Circulatory Organs.—Pulse agitated during the febrile period in one case (that of Morz) dicrotic, heart good, spleen palpable in one single case (that of Van—), no intestinal hæmorrhage, no epistaxis.

Respiratory Organs.—Never any dyspnœa, nor bronchitis and laryngitis, in fact never any pulmonary symptoms.

Urinary Organs.—Urine clear or with sediment, rich in carbonates and phosphates; no albumen and no biliary pigment.

Nervous System.—Sometimes stupor, more especially at the beginning of the illness; absolute insomnia during the whole of the illness; no delirium, intelligence unimpaired; patients were aware of everything that went on around them, and always answered questions correctly.

General Symptoms.—Complexion pale, no prostration, manifest wasting, and loss of strength; the patients were always able to go alone through the ward to make use of the hygienic pail placed in a corner to receive evacuations.

The course of the illness is not a disquieting one, and exhibits no complications. Convalescence is somewhat tedious.

What is this affection?

Is it gastric malarial fever? I doubt it, for though no examinations of blood were made, salts of quinine, whether administered by the mouth or by injection, was quite inefficacious, and the patients, once convalescent, never exhibited relapses.

Is it typhoid fever of medium intensity?

In both illnesses one finds prodromal symptoms, consisting of diarrhœa or constipation, insomnia, and a high temperature on the evening of the fourth day. But the course of the illness is different, the temperature chart always exhibiting a remission, followed by a renewed rise; the total absence of chest symptoms (bronchitis, laryngitis), and the slightness of the nervous symptoms, the lightness, if not absence, of abdominal symptoms (tumefaction of the spleen, lenticular pink spots, pain on pressure of the right iliac

fossa, abdominal flatulence), to my mind differentiate these two illnesses; the analysis of the water on the men-of-war yielded the fact that, from a bacteriological point of view this water was pure, and it is a well-known fact that water is the usual vehicle of Eberth's bacillus. Again, taking into consideration the absence of true typhoid fever in the town and garrison, it is difficult to admit that we only should have been attacked by this ailment. It seems to me more probable that the few cases amongst civilians considered to be typhoid, were as a fact, of the same nature as those we had on the Fleet.

May not our vicinity to Malta lead us to suspect that Mediterranean fever, endemic on that island, is the true diagnosis of our illness? In both illnesses there is fever, diarrhœa or constipation, curious variations of temperature; but in Mediterranean fever there is a different evolution; the acute stage is attended by pulmonary symptoms, profuse sweats and delirium, the latent (monotonous) period lasting about twenty-four days, is characterised by an amelioration of the digestive symptoms, the persistence of sweats, and the appearance of pains of the nature of rheumatic orchitis.

It will be observed that nothing similar to this occurred either on the Fleet or in hospital.

The illness described by me seems therefore to be a specific ailment, and although bacteriological evidence is lacking, it would seem that it is of a microbic nature, as evinced by its prodromata, its special course, and its long period of convalescence. As to the question of its contagiousness, I do not consider it to be so. The cases which I had under treatment came from various ships.

In the infirmary I observed no case of contagion. I am of opinion that there is a microbe, but what is it? I reject Eberth's bacillus and Laveran's hæmatozoon, for reasons stated above.

The idea of considering the *Coli communis* as the agent of this illness is strengthened by the confirmation of the presence of this bacillus in the waters of the establishments near the Fleet, and which were frequented by our patients, as I found on enquiry.

Moreover, we are aware that this microbe is the constant host of the human intestine, and that under the influence of intense heat, atmospheric electricity, damp, great variations in the night and day temperatures, agricultural work, and, in brief, on every occasion which causes any individual to be run down. This bacillus acquires virulence, becomes noxious, and sometimes causes symptoms so serious that they have been thought to be originated by Eberth's bacillus, until bacteriological examination has refuted the presence of the latter.

I admit that the *bac. coli* may, by its toxin, have given rise to the symptoms described in this article, but I cannot say whether the germ came from outside, or whether its virulence was heightened in our men during the past months.

In common with other authors I call this illness *remittent climatic fever*; that is to say, a feverish gastric disorder, transformed, enlarged on this tropical coast of the Mediterranean, where it acquires a greater importance than it has in France, its duration being doubled or trebled by the exaggeration of its symptoms.

This febrile gastric disorder, which must not be confused with even slight typhoid fever, has existed here the whole year. It has been of short duration during the winter, but during the intense heat of August it acquired great tenacity and particular intensity. In September and October some cases, until the seventh day of illness, gave one the impression of actual typhoid fever, but the subsequent evolution of these cases were such that the most sceptical were obliged to accept the diagnosis as that of a gastric febrile disorder. Besides these almost classic cases some others occurred, the evolution of which demanded a special appellation.

Thus from September to the beginning of November we had in the Fleet many cases of simple feverish gastric disorders, nine cases of remittent climatic fever, and two cases of typhoid fever.

It is difficult to explain this last-mentioned illness, as its usual agent, water, did not contain any germs, and there were no cases either in the garrison or in the town. It is also difficult to explain away the contradiction mentioned at the commencement of this report.

On studying the history of disease of Mim—and Lon—I found that they recently arrived from Toulon, where typhoid fever is endemic, and the idea that these young sailors took the germs of the illness in this town is changed to certainty, on remembering Verneuil's opinion on latent microbism.

The treatment of remittent climatic fever is that adopted for febrile gastric disorders. Some cases, in consequence of the rise of temperature of the first stage, necessitated cold baths; but hygienic care, alteratives, and intestinal antiseptics were sufficient in most of the cases.—*Archives de Medicine Navale*, March, 1901.

NAVAL MEDICAL OFFICERS' GRIEVANCES.

[Reprinted from the *Naval and Military Record*, May 9, 1901.]

SIR,—In your issue of April 18 appeared a letter from a correspondent respecting the difficulty of recruiting medical officers for the Royal Navy. In reality there is no competition for entry, and, with a few notable exceptions, no acquisition of men of first-class ability, such as former hospital house-surgeons or University graduates. Your correspondent also dwelt on the recent suspension of voluntary retirement in all ranks, from the recently-entered surgeon, who realises that naval life is unsuited to him, to the fleet surgeon, who has served on with a prospect, or promise, that in that rank retirement with pension would be granted.

In the same issue was a letter that recently appeared in the *Times*, specifying other disabilities of naval medical officers which, it is firmly believed, affect recruiting from medical schools of young qualified medical men of superior attainments.

The *Times* correspondent, evidently with an expert knowledge of the present feeling of his brother officers, specifies—

(a) The out-of-date rate of pay they receive. The Medical Council, by abolishing the employment of

unqualified assistants in civil practice, have raised the "market price" of young qualified medical men very considerably, in fact doubled it, while the demand for such men of superior qualifications in our colonies, territories, and spheres of influence has further enhanced their pay and emoluments.

The pay of medical officers on entry is virtually the same in the Royal Navy, the army, and the Indian Medical Service, and this was fixed over twenty years ago.

(b) Study leave. The necessity for this in the present day is fully recognised in civil practice; hence the post-graduate courses and the recently established Polyclinic in London.

Although this essential privilege has been granted recently to some few senior fleet surgeons, owing to the small establishment of naval medical officers the privilege has been denied to surgeons returning from their first foreign commission, by which time they have probably realised that their qualifying examination for degree or diploma, or for entry into the Royal Navy, was no indication of their ability to treat the diseases of foreign climates according to the most recent discoveries and researches in those diseases which are now so efficiently treated at the Tropical Disease Schools at the Albert Docks, London, and at Liverpool in post-graduate courses.

The importance of this post-graduate study was recognised fully by the late Admiralty Departmental Committee, under the presidency of Admiral Moore, but it seems doubtful if it is fully appreciated at the Naval Medical Department.

There is a still further naval medical grievance, viz., the denial to these officers alone of extra pay for extra duties. This dates from the economical administration of the naval medical service a few years ago—an economy carried out at the cost of efficiency and reform in the medical personnel and the hospitals of the Royal Navy which the present more liberal-minded administration has found to be a fine field to cultivate and improve, but not thoroughly so far.

In this connection, I am reminded of the action of a Commander-in-Chief on the China station some years ago who cut down everything that was possible, including the sale of invaluable naval property at Hong Kong and Shanghai, which can only be recovered at immense cost. One of his captains, who will be recognised by many senior naval officers under the familiar and affectionate sobriquet "Daddy," suggested to his chief that to put the finishing stroke to his reign of economy he should hand over his command to a lieutenant. Suffice it to say that the Commander-in-Chief did not concur in his suggestion!

A sub-committee of the British Medical Association has recently considered and reported on the army medical service, specifying their views as to the necessity for reform and the reforms considered necessary in their opinion. As this in the main equally applies to the naval medical service, allow me to briefly record the reforms stated as essential to the efficiency of the Royal Army Medical Corps:—General under-manning; insufficient pay; insufficient professional inducements, ambitious students are deterred from the army (substitute Royal Navy) because they see no encouragement or reward for professional excel-

lence only; the examinations for entry of duly qualified medical men in elementary subjects instead of in advanced medicine, surgery, hygiene, bacteriology and analysis; seniority promotions which are too much the rule in the army (and Royal Navy, as "M.O.R.W." pointed out in the "Times" letter); disabilities of house surgeons of civil hospitals on entering the public medical services, where they are liable to find themselves junior to contemporaries who may have been entered direct after qualification.

Thus a most desirable class of recruits are lost to the public services where professional ability, even in the medical branches is unrecognised, while the luck of war service, irrespective of necessary professional or administrative ability, wins promotion to the highest ranks, with honours.

I write with a personal knowledge of the naval medical service from a little before the present rates of pay were fixed, and from a large acquaintance with the present *personnel* of that service, but will venture to sign myself

SPERO MELIORA.

ON THE TREATMENT OF DYSENTERY BY LAVAGE.

[Reprinted from Medical Archives of the Federated Malay States.]

By W. LEONARD BRADDON, F.R.C.S.

A REPORT is here given of the results obtained in the treatment of 337 cases of dysentery in Negri Sembilan hospitals during the past year.

In introducing this matter to notice it may be pointed out that dysentery (and chronic diarrhoea) still form the most fatal among disorders treated in our hospitals.

In the hospitals of the Colony and the Native States the case mortality of the former disease was returned as follows for 1899:—

	Cases of Dysentery.	Mortality.	Per cent.
Singapore Hospitals..	474	199	42
Penang ..	228	105	26
Malacca ..	103	30	29
Province Wellesley Hospitals	70	35	50
Perak Hospitals ..	1,407	342	24
Selangor Hospitals ..	659	187	28
Negri Sembilan Hospitals ..	—	—	17

There is room therefore for great improvement in our treatment of this disorder. In the Negri Sembilan the case mortality in 1896 was 33·3 per cent., in 1897 34·4 per cent. In 1898 it fell to 17·88 per cent.

In that year the method of treatment was first tried to which attention is now drawn.

The cases were classed according to nationality and age. Note was made as to the presence or absence of *amœbæ* in the stools. In treatment by *ipecacuanha* preparations, the use of large doses of the root with a preliminary stomachic sedative, and the use of small doses of Dover's powder, sometimes combined with bismuth or other astringent, or an internal antiseptic was included. In treatment by

sulphate of magnesia the usual method was pursued, a tablespoonful of saturated solution of the salt being administered every hour until bleeding and tenesmus were relieved. In *lavage*, the routine was to thoroughly wash out the whole colon by douching with several pints of solution at 35 degrees. A quantity of solution sufficient to fill the whole colon could, it was found, be easily retained without any discomfort if run in slowly while the hips were well elevated.

Attention will only be drawn to the results of the modes of treatment employed:—

(1) SEVENTY-SEVEN CASES TREATED BY PREPARATIONS CONTAINING IPECACUANHA.

The *mortality* was 311 per thousand; recoveries under 20 days, 778 per thousand; recoveries under 10 days, 415 per thousand; the remainder occupying various periods up to and over three months.

(2) EIGHTY-EIGHT CASES TREATED BY SATURATED SOLUTION OF SULPHATE OF MAGNESIA.

The *mortality* was 236 per thousand; recoveries under 20 days, 745 per thousand; recoveries under 10 days, 450 per thousand; the remainder all, eventually, within three months.

(3) ONE HUNDRED AND SEVENTY-TWO CASES TREATED BY LAVAGE COMBINED IN SOME CASES WITH ASTRINGENT AND OTHER DRUGS.

The *mortality* was 180 per thousand; recoveries within 20 days, 743 per thousand; recoveries within 10 days, 476 per thousand. Of the forms of lavage used, the best result appears to have been obtained with a solution of boracic acid. Eighteen cases were treated by this method without a death.

The next best result was by lavage with the same solution, aided by the exhibition of a mixture of bismuth, Dover's powder and salol in equal parts: mortality 125 per thousand. Lavage with quinine solution only, and the same aided by simple astringents given by the mouth, afforded the next best results: mortality 229 and 227 per thousand.

As regards the severity of the cases treated, the mildest cases, as might be expected, showed the best results; the mortality in cases where stools were under 10 per diem being 184 per mille; when they were 30 or more, 920 per mille. The former formed by far the largest proportion of cases—viz., 738 per thousand.

Viewing the methods of treatment with regard to the severity of the case dealt with, it is seen that the treatment-group exhibiting the greatest mortality—the *ipecacuanha* series—was also that in which the mildest cases were most numerous—805 per thousand having under 10, 90 per thousand under 20, and 103 per thousand 30 or more stools per diem.

Of the cases treated by lavage fewer belonged to the mild groups (691).

Of the most severe cases (38 in all) 20 treated by lavage, 10 with quinine solution, and the salol, bismuth and Dover's powder combinations in addition, the mortality was 263 per thousand.

As regarded the presence of amœbæ, that point was determined in 113 cases, in 41 of which they were shown to be present, in 72 absent. The mortality differed little in the two series. With respect to nationality, Chinese formed 379 per mille, Tamils 560 of cases treated. The mortality was higher among the former (250 as against 203).

The conclusions offered are:—

(a) That lavage of the colon with antiseptic solutions is the best method of treating dysentery as met with in the Malay States.

(b) That the lavage to be effective should be copious and frequent.

(c) The most useful solution is a weak solution of boracic acid.

(d) The use of astringents and antiseptics, such as bismuth, Dover's powder and salol, is beneficial when lavage is being also carried out.

(e) Saturated saline solutions given *per oram* are less useful than lavage, although they have their place in treatment.

(f) Ipecacuanha is the least successful of the medicaments in practice.

NOTE ON THE OCCURRENCE OF "GOUNDU" OR GROS-NEZ IN THE MALAY PENINSULA.

[Reprinted from Medical Archives of the Federated Malay States.]

By W. LEONARD BRADDON, F.R.C.S.

THREE instances of this affection, described as common in Western Africa, have come under my notice. The patients were two of them Boyanese (natives of Sumatra), one a Malay.

The affection, which has been lately well described in the JOURNAL OF TROPICAL MEDICINE, consists in a slowly growing tumour, generally symmetrical in size and shape, at the angle between the nose, the orbit, and the forehead on either side, and is apparently due to a sub-periosteal chronic inflammatory process involving the nasal process, and perhaps orbital plate of the superior maxilla, and the nasal bone. The swellings are smooth and firm, even hard to touch.

The overlying skin is not involved and is free of inflammatory signs. The tumours produce no pain, and unless growing to such a size as to interfere mechanically with vision do not in any way trouble the patient. In cases described elsewhere a history of previous discharge from the nares has been given, but there was no account of this in my cases. The patients desired no interference, and were unwilling to allow removal of any portion by exploration for culture purposes. There would appear to be little doubt of the specificity of the characters of this affection, as a disease *sui generis*; of the usual natural termination of such cases I have no information.

PRIMARY SPLENOMEGALY.

BRILL records three cases of splenic enlargement occurring in one family, which, he believes, must be classified as primary overgrowths. The family history, paternal and maternal, is good. The mother of the three patients has had six children, of whom two are in good health, and one died of marasmus at 3 years of age. The youngest child, who was not seen by the author, died when 9 years of age from asthenia, with a great enlargement of the spleen, no examination of the blood having been made. The second of the cases occurred in the third child, who is now 34 years of age. The enlargement was first noticed in 1888. There is no history or sign of malaria, syphilis, rickets, or tuberculosis. The lymphatic glands have never been enlarged. The patient had suffered from hæmorrhagic rashes and from bleeding from the gums. In 1895 the blood count was: red cells, 4,800,000; white, 7,168; hæmoglobin 80 per cent. The spleen now extends to within a few centimetres of the right superior anterior iliac spine. The last of the patients, male, aged 30, has no history of syphilis, malaria, or rickets. Slight enlargement of the spleen was found by examination in 1889, since which time the patient has been treated by Fowler's solution at intervals. There have been attacks of epistaxis from time to time since 1890, but the man has not ceased work till an attack of dysentery in 1900. In October, 1900, the spleen reached the middle line three centimetres above the umbilicus, the liver was distinctly enlarged, and there was moderate anæmia of the chlorotic type. With regard to the last two cases, Brill excluded malaria, syphilis, tuberculosis, and amyloid disease by the history. Repeated examinations for the plasmodium malariae gave negative results. The absence of fluctuation excluded echinococcus cyst. Passive hyperæmia was disproved by the extent of the enlargement and the absence of recognisable cause. The long duration of the cases, the complete resistance to treatment, and the fact that the anæmia did not occur in either case for more than ten years after the onset, and then was only slight in extent, present a complex of symptoms very different from that of the so-called splenic anæmia. The absence of any subjective sign of distress in spite of the great overgrowth of the spleen is noticed as remarkable.—*Amer. Journ. of Med. Sci.*, April, 1901.

ERADICATION OF YELLOW FEVER IN HAVANA.

In his letter accompanying the report of the vital statistics of Havana for March, Major Gorgas, the chief sanitary officer, calls attention to the fact that Havana at last is free from yellow fever. He expresses the opinion that never before has that city been so long free from the disease, and attributes the present conditions in a large part to the systematic war waged on mosquitoes during the month

of March. He has, he says, the strongest hopes of destroying the foci in that way. In former times and even since the American occupation the milder types of the disease passed largely unrecognised, and no such strenuous attempt was made to report them as is the case at present. Hence the significance of present conditions, and it is evident that the health authorities of Cuba are trying to verify clinically as well as experimentally the mosquito origin of the propagation of the disorder. This is only the beginning of the clinical test of the theory, but it is apparently a promising one. If they succeed in stamping out yellow fever, this result alone will be worth all the cost of the Spanish-American War. What can be done in Cuba can be done also elsewhere, and with this scourge of the American tropics, and malaria, eliminated, the area of the habitable globe will be appreciably increased for the white race, to say nothing of the removal of the danger to our southern coast from Cuban foci of the disease. —*Journ. Amer. Med. Assoc.*, April 27, 1901.

AN expedition to investigate the practicability and the possibility of affording protection on a large scale against mosquito bites, as a prophylaxis in malaria, is to proceed from Liverpool to West Africa shortly. Major Ronald Ross goes with the expedition, at least for a time, to select an appropriate locality at which to start work. The expedition owes its origin to the liberality of a generous donor, but one whose name has not been allowed to transpire. Every one, layman and doctor, must be deeply interested in an expedition of this nature, and we wish its members success in their noble work and safe return.

Correspondence.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

GENTLEMEN,—Under separate cover I have forwarded you a photograph of a large keloid.

The history of the case is that the boy got severely burnt on the buttocks. He was entirely neglected by his relatives, until the sores got full of maggots. After this they washed it now and again, and applied some kind of oil. Altogether it took several months to heal. When I saw him it was in its present condition. The tumour averages about 1 in. in depth and has a somewhat regularly honey-comb appearance all over. The finger-like processes are particularly well-marked. In the middle of the right buttock there is a part of it whitish-looking and almost of horny consistency.

Small keloids are fairly common here, especially about the hands and face, but this is much the largest I have yet seen. It is peculiarly sensitive to touch, but not painful on pressure.

Yours very sincerely,
JAS. CRAN.

Belize,
April 18, 1901.

Current Literature.

CHOLERA.

In a paper read before the Bombay Medical and Physical Society, on January 18, 1901, and published in full in the *Lancet* of April 20, 1901, Dr. George Lamb, Capt. I.M.S., gives in detail the results of his investigations as to whether any relation could be traced between the incidence of cholera and the prevalence of comma bacteria in the well water of Gujerat. The inquiry was undertaken during the period of famine in the month of May, 1900. The result of the research was to show that none of the comma-shaped bacteria which were isolated from these wells could be termed a true cholera vibrio, but that they belonged to the tribe of curved bacteria, of which the true cholera microbe is one. The relation between the presence of these comma-shaped organisms in the well water and the prevalence of cholera in the district was fairly conclusively proved. In fourteen of the localities, in which the well water was examined, it was found that in eight the comma-curved bacteria were found and in six they were absent. In the eight districts where the bacteria were found, cholera prevailed at the time, or immediately after the period of examination, and in the six where it was not found no cholera existed. These observations, as well as others conducted in Calcutta by Mr. Haffkine and Professor W. J. Simpson, tend to show that without having any information as to the actual prevalence of cholera, the bacteriological examination of the waters of a district would give a useful warning as to the danger from cholera which exists in these districts. The importance and far-reaching hygienic practical results of an investigation of the kind are at once apparent; for by bacteriological search for the presence or absence of comma-curved bacteria in the well water, the incidence of, or freedom from, cholera outbreaks, could be anticipated and guarded against, or accurately prognosticated. All wells, even in an infected district, are not always contaminated by comma-shaped bacteria; and the fact that some are and some are not so contaminated, determines which well can and which cannot be used, thereby avoiding the necessity of evacuating a locality when a few cases of cholera appear.

TYPHOID.

TYPHOID FEVER IN THE NATIVES OF INDIA; ITS DIAGNOSIS BY MEANS OF THE SERUM SEDIMENTATION RE-ACTION.—Dr. George Lamb, Captain I.M.S., after a study of the serum sedimentation re-action in cases of "fever" in Bombay, has come to the conclusion that typhoid is much more common amongst natives, especially children, of India, than is commonly supposed. Captain Lamb holds that in many of the so-called continued and remittent fevers in India, it is impossible to come to an accurate diagnosis by watching the clinical symptoms alone, and that even *post-mortem* appearances, unless supplemented by a bacteriological investigation of the organs, does not in every case suffice to prove the absence or presence

of the bacillus typhosus. He draws attention to the fact that there are many cases on record of the nature of a typhoid septicæmia, in which the characteristic intestinal lesions of typhoid are absent, and in which the diagnosis can only be made clear by the serum agglutination test during life, or by the isolation of the specific bacillus from the spleen and other organs after death. The primary objects of the investigation made by Captain Lamb are: (1) To emphasise the fact that in serum agglutination and sedimentation we have at hand a trustworthy and rapid method of assisting in the differentiation of tropical fevers; (2) to point out that cases of typhoid infection are much commoner in the natives of India than is generally supposed, and are in some instances only able to be recognised by means of the re-action which the serum gives with the specific bacillus.

Captain Lamb gives in detail a number of cases submitted to the serum sedimentation re-action test, and his results go to confirm the value of the test in the differentiation of tropical fevers of doubtful type.

NOTE ON THE RESULTS OBTAINED BY THE ANTI-TYPHOID INOCULATIONS IN EGYPT AND CYPRUS DURING THE YEAR 1900. By A. E. Wright, M.D.Dub., Professor of Pathology, Army Medical School, Netley.—I am indebted to the kindness of Colonel W. J. Fawcett, R.A.M.C., Principal Medical Officer in Egypt, for the following statistics dealing with the incidence of enteric fever, and the mortality from the disease for the year 1900, in the inoculated and uninoculated, among the British troops in Egypt and Cyprus.

	Average annual strength	Number of cases of enteric fever	Number of deaths from enteric fever	Percentage of cases calculated on average annual strength	Percentage of deaths calculated on the same basis
Uninoculated	2669	68	10	2.5	0.4
Inoculated ...	720	1	1	0.14	0.14

These figures testify to a nineteen-fold reduction in the number of attacks of enteric fever and to a three-fold reduction in the number of deaths from that disease among the inoculated.

In a note appended to the statistical table printed above, Colonel Fawcett observes that the measure of protection resulting from the inoculation is not fully disclosed by a comparison of the figures of cases and deaths given in the table. Owing to the circumstance that soldiers inoculated in previous years are in the statistics included among the uninoculated, the number of the uninoculated was in reality less, and the number of the inoculated was in reality greater, than the figures set down for these groups in the first column of the above table. The figures in the second and third columns, on the other hand, accurately represent the number of cases and deaths in the inoculated and uninoculated, inasmuch as none of those inoculated in previous years contracted enteric fever.

A further point adverted to by Colonel Fawcett is that the only case which occurred among the inocu-

lated occurred in the case of a patient admitted to hospital on the thirty-third day after inoculation. It would seem that the disease was in this case contracted before anything in the nature of protection had been established by the inoculation.

YELLOW FEVER.

CASES ON BOARD H.M.S. "CONDOR."—We are informed by the Admiralty that the latest information regarding yellow fever on H.M.S. *Condor*, is to the effect that a telegram dated April 29 had been received from Esquimalt stating that the vessel arrived on that day and there was no yellow fever on board. Two cases had previously occurred and had been landed at Panama.

MISCELLANEOUS.

ANKYLOSTOMUM DUODENALE.—In a note on the prevalence of ankylostomum duodenale in the Darbhanga (Durbunga) district, Bengal, Dr. J. T. Calvert, Major I.M.S., states that an examination of the stool of each prisoner admitted to the district jail showed that the ova of the ankylostomum duodenale occurred in no less than 83 per cent. of the first hundred cases examined. The percentage of ova of other parasites present in the cases referred to was (1) *ascaris lumbricoides*, 39 per cent.; (2) *trichocophalus dispar*, 12 per cent.; (3) *oxyuris vermicularis*, 9 per cent. The ankylostomum was found also to be equally prevalent amongst the general population attending the dispensaries in Darbhanga, children as well as adults being affected. Captain Calvert remarks, that exactly how much sickness and mortality can be ascribed to this intestinal parasite, appears to be as yet impossible to determine. *Ciliated infusoria* were met with occasionally in the stools of patients being examined for parasites.

ELEPHANTIASIS OF THE SCROTUM.—*The surgical technique and operative treatment of elephantiasis of the generative organs, based on a series of 140 consecutive cases.* In the *Indian Medical Gazette* of March, 1901, Major R. Havelock Charles, I.M.S., Professor of Surgical and Descriptive Anatomy and Clinical Surgery, Calcutta, contributes a most valuable article on the surgical procedure requisite for the removal of elephantiasis of the generative organs. The best test of the success of Major Charles' method is to be found in the fact that all the cases treated, to the number of 140, recovered, and that in most an excellent covering to the generative organs was obtained. The article in question is really an exhaustive account of the operation, inasmuch as every detail of the procedure is dwelt upon and exactly described.

The patients operated upon varied from 16 to 62 years of age; and in many, hernial and other complications existed; and the fact that other parts of the body, such as the arms and legs, were implicated in the disease, did not prove a deterrent to the surgical treatment.

The principles enunciated by Major Charles are:—(1) Careful general and local preparation; (2) asepsis;

(3) the lithotomy position during the operation; (4) the rubber cord as a means of arresting hæmorrhage is not regarded as necessary nor even expedient; (5) bleeding is prevented or arrested by torsion and clamp torsion and not by ligatures; (6) the penis is enucleated by a dorsal incision commencing at the pubis and carried to the preputial orifice; (7) the lateral incisions commence over the external abdominal rings and are carried, in sound tissue, backwards between the scrotum and thighs, to meet in front of the anus; (8) the cords and testicles are enucleated by incisions parallel to the course of the cords, and are made after, not before, the lateral cuts; (9) skin flaps from the inside of the thighs are brought to meet in the median line after the skin and subcutaneous tissues of the flaps are separated; the testicles are maintained in position in the pockets formed by the skin over the perineum; (10) the prepuce is stitched to the penile tissues; (11) the flaps are stitched to the penile tissues around the root of the organ; (12) the penis is dressed separately to the other parts of the wound, by being bandaged from point to root; (13) gauze, (perchloride or iodoform), in single filmy thicknesses, is applied by allowing it to fall from above downwards on the parts, covering them from near the umbilicus well out on to the groin and as far back as the anus. The bandage around penis is stitched to the main dressing; (14) a roller bandage, composed of "bandage cloth," obtainable in Indian bazaars, is applied over all so as to maintain equable pressure. Calico bandages are not suitable.

The article is illustrated by excellent photographs. Elephantiasis in the female is also dealt with, and a tabular list of the numerous cases is appended.

HOW TO COLLECT MOSQUITOES AND SEND THEM FOR EXAMINATION. A Request for the Collection and Sending of Mosquitoes. By Dr. C. Meuse.—The most recent discoveries as to the etiology of malaria and yellow fever have directed the attention of the medical world to the hosts of the originators of these illnesses—the mosquitoes. Observations on these insects from a systematic and biological standpoint promise to reveal much that is new, and may be of assistance in furthering the progress of hygiene and pathology.

We request readers and workers to direct their attention to the *Culicidæ*, and during their travels in malaria and yellow fever regions, to collect these insects, and if not able to examine the same themselves to send us the specimens. The transmission is very easy. The insects, caught with a short-handled gauze net, which can easily be carried in the pocket, are killed in a re-agency glass or glass bottle, by damping the wadding stopper slightly with benzine. Still easier is it to place them in a wide-necked bottle with a tightly fitting stopper, at the bottom of which there should be a piece of cyanide of potassium over which plaster of Paris, mixed with water, has been poured to fasten it down. Afterwards the insects are dried in the air and placed loose in a small cardboard pill-box, the inside of which has been lined with oiled paper. A great many mosquitoes can be packed and sent home in this way. But the most desirable way of preserving and sending the mosquitoes is in 75

degrees alcohol. But the glass bottles, tubes, &c., must be filled right up and hermetically sealed so that no bubbles of air find entrance, or evaporation takes place with consequent injury of the contents through movement. A few accompanying remarks respecting place, time, temperature, and the conditions of wind and weather at the place of capture will be very useful. The question as to where the insects are found, if in houses, tents, ships' cabins, railway carriages, &c., and where their breeding places are; if they avoid or frequent certain places, spaces, coverings of walls and floors; if they travel on ships or in trains, and under what conditions the insects show a tendency to fly and bite, are all points of important practical signification.

Even the smallest contribution will be welcomed by the Editor, who will have the same worked up, or will be pleased to help the sender with advice. —*Archiv. für Schiff's-und-Tropen-Hygiene*, April, 1901.

A STRIKING confirmation of the malaria mosquito theory, substantiated by statistics, is given by Dr. Procaccini in the *Annales di Medicina Navale*, Nos. 11 and 12, 1900, in an article entitled "Ricerche profilattiche contro la malaria istituite sulla Costa Sarda." On the coast of Palau on the North of Sardinia, where there is a garrison consisting on an average of from 90 to 130 men, the statistics of attacks of malaria from 1895 to November 1, 1900, are as follows:—1895, 700 cases; 1896, 583 cases; 1897, 348 cases; 1898, 394 cases; 1899, 571 cases; 1900, 107 cases. The author realising the gravity of these numbers amongst a small population, tried various methods to keep the mosquitoes at bay. Of 104 persons who placed themselves at the disposal of Dr. Procaccini for this purpose, only one had malaria, and this was owing to the individual not having taken the precautions required. The methods adopted for keeping off the mosquitoes were simple to a degree, consisting only of the use of mosquito nets and the wearing of suitable caps, gloves and clothes.

EXPERIMENTAL INOCULATION OF MALARIAL FEVER IN NAGPUR.—Dr. Andrew Buchanan, Major I.M.S., in the *Indian Medical Gazette* of April, 1901, contributes an excellent article on this subject in which he gives details of experiments in malarial inoculation by mosquitoes. His experiments confirm the belief that mosquitoes are active agents in the spread of malaria. In the course of his article a number of important points are discussed.

(a) *Four kinds of malarial fever are found in Nagpur*, viz., quotidian, benign tertian, quartan, and malignant tertian; the unpigmented quotidian has not been met with in Nagpur.

(b) In untreated cases of malignant tertian, the temperature chart shows frequently three fairly distinct periods: (1) a tertian fever with gradually lessening paroxysms; (2) an interval of four to five days when fever is absent or very slight, during which period crescents will be found in the blood; (3) the flagellar or secondary fever, at which stage flagella will be found in the abstracted blood.

(c) Major Buchanan is of opinion that the second-

ary or flagellar fever may be possibly due to ex-flagellation occurring in the blood *inside the body*.

(d) Number of *Culex* eggs. In a tank almost two feet square there were, during the month of December, 1900, collected some 17,000 egg boats, which reckoning at the rate of 250 eggs per boat brings the number of eggs to over 4½ millions.

(e) *Preserving Anopheles*. A small quantity of mud placed in the bottom of the glass tumblers in which mosquitoes are kept serves to give the insects a resting place, and thereby lengthens their period of life. The larvæ of the mosquitoes feed readily on the pollen of grass seeds when it is shaken off in their cages.

(f) *The colour of clothing attracts or repels Anopheles*. The men engaged in collecting mosquitoes find that *Anopheles* hide themselves in their clothing when its colour is black, but that the insects avoid men with white coats.

Letters, Communications, &c., have been received from:—

- B.—Dr. W. J. Boase (Berbice).
 C.—Dr. Carpenter (Cyprus); Staff. Surg. J. E. Coad, R.N. (Bermuda); Dr. J. Cran (Belize).
 D.—Mr. A. B. Duprey (Grenada); Rev. R. J. Dye, M.D. (Haut Congo).
 E.—Dr. M. D. Eder (Palmira); Dr. Alex. Edington (Grahamstown).
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 H.—Capt. C. B. Harrison, I.M.S. (Madras).
 J.—Dr. H. Noble Joynt (Fiji).
 K.—Dr. W. E. de Korte (Cape Colony).
 M.—Dr. P. Manson, C.M.G. (London).
 N.—Dr. F. Neal (Demerara); Dr. Chas. Neill (Nudea).
 O.—Dr. Ozzard (Brit. Guiana).
 P.—Dr. J. W. Plaxton (Jamaica); Dr. H. Campbell Perkins (Travancore).
 R.—Dr. R. Ross (Liverpool).
 S.—Miss S. H. Smith (Lucknow); Dr. E. J. Stubbart (New York); Rev. James Sandilands (New Hebrides).
 T.—Mr. F. V. Theobald (Wye); Rev. G. R. Turner, M.B. (Amoy); Dr. J. C. Thomson (Hong Kong).
 W.—Lt. Col. Whitehead, R.A.M.C. (Punjab).

EXCHANGES.

Annali di Medicina Navale.
 Archiv für Schiffs u. Tropen Hygiene.
 Archives de Medicine Navale.
 Archives Russes de Pathologie, de Medec., Clinique et de Bacteriologie.
 Australasian Medical Gazette.
 Boletin de Medicina Naval.
 Boston Medical and Surgical Journal.
 Bristol Medico-Chirurgical Journal.
 British and Colonial Druggist.
 British Journal of Dermatology
 British Medical Journal.
 Brooklyn Medical Journal.
 Climate.
 Clinical Journal.
 Clinical Review.
 Giornale Medico del R. Exercito.

Hongkong Telegraph.
 Il Policlinico.
 Indian Engineering.
 Indian Medical Gazette.
 Indian Medical Record.
 Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.
 Journal of the American Medical Association.
 La Grèce Médicale.
 Lancet.
 Liverpool Medico-Chirurgical Journal.
 Medical Brief.
 Medical Missionary Journal.
 Medical Record.
 Merck's Archives.
 New York Medical Journal.
 New York Post-Graduate.
 Pacific Medical Journal.
 Polyclinic.
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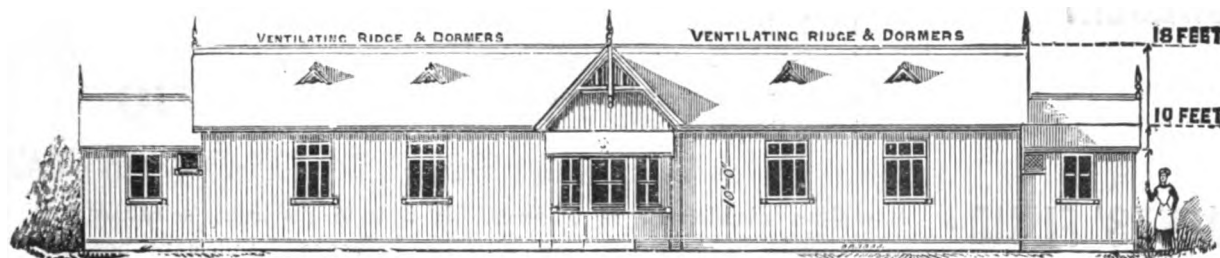
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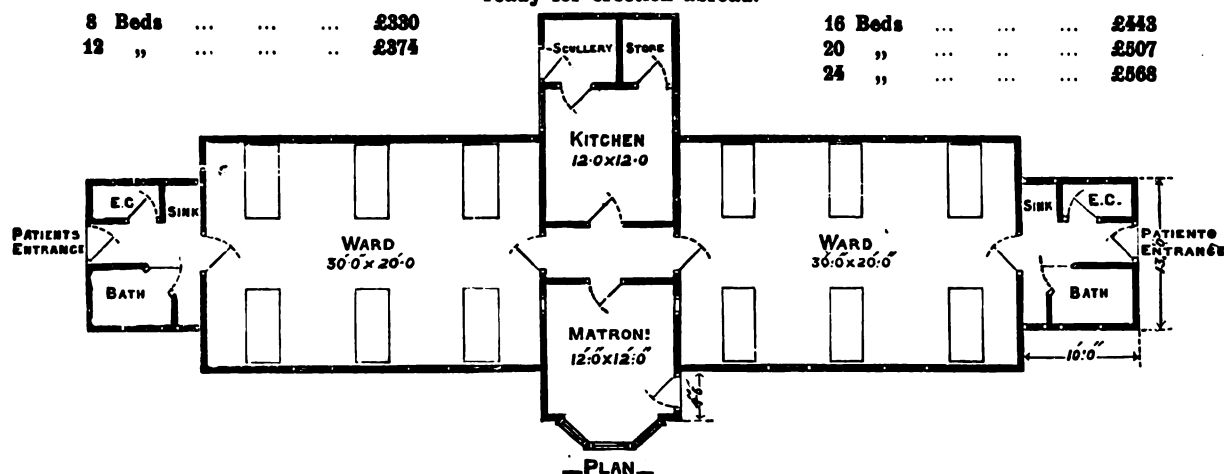


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*BIHYDROBROMATE	60.0 %	" 7 "	1.23
BISULPHATE	59.1 %	" 11 "	1.24
PHOSPHATE	72.8 %	" 78 "	1.01
VALERIANATE	75.7 %	" 110 "	.97
*LACTATE	78.2 %	" 10 "	.94
SALICYLATE	70.1 %	" 225 "	1.05
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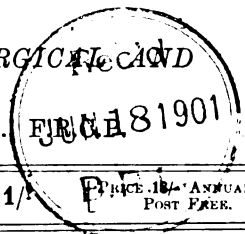
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EDITED BY JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D.



No. 11. Vol. IV.]

LONDON, SATURDAY, JUNE 1, 1901.

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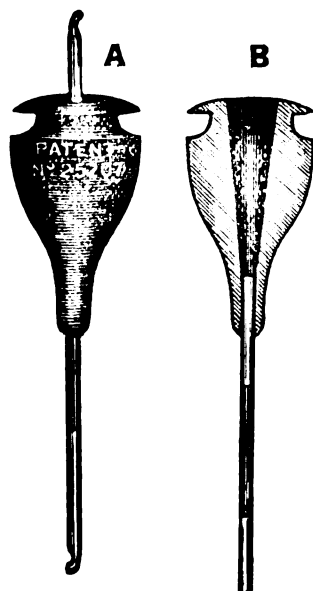
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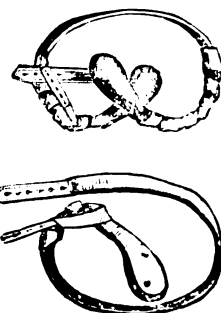
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The Journal of Tropical Medicine.

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Original Communications.

NOTES ON THE DISEASES MET WITH IN UGANDA, CENTRAL AFRICA.

By ALBERT R. COOK, B.A.Camb., M.B., B.Sc.Lond.
Medical Missionary.

THE following remarks are based on observations made on 1,500 in-patients admitted to the Church Missionary Society's Hospital at Mengo, between May, 1897, and March, 1901, and on some 40,000 out-patients.

The British Protectorate of Uganda is a very hilly country intersected by the Equator and lying immediately to the north of that immense body of fresh water, the Victoria Nyanza Lake, with its area of over 20,000 square miles. The country lies at a mean elevation of over 4,000 feet above sea-level, and most of it consists of a countless number of hills and ridges separated by swamps densely packed with papyrus. There are but few rapid rivers. The climate is cool for Equatorial Africa, the temperature in the shade seldom rising above 80 degrees F. There are two wet seasons, the first commencing about the middle of March, the second about the middle of September, and both lasting some three months. Rain falls as a rule all the year round, *i.e.*, even in the dry season a month seldom passes without some good showers. The staple food of the natives, the Baganda, is either steamed or mashed plantains or sweet potatoes. A good deal of fermented banana wine is drunk.

The natives themselves are very intelligent, clean, and splendidly developed physically. They live in thatched houses scattered about their banana plantations. The soil is either red clay or igneous rock.

After these preliminary observations, let me proceed to an analysis of the 1,500 in-patient cases. Of these 779 or 52 per cent. were medical; 585 or 39 per cent. were surgical; 136 or 9 per cent. were gynæcological or obstetric.

The following table shows the occurrence of the chief forms of disease met with:—

		Total admissions.
Cases of malarial fever	... 367,	forming 24½ per cent.
Veneral diseases (including cases of stricture)	... 157,	" 10½ "
Cases of stricture	... 47,	" 3 "
Diseases of digestive system	74,	" 5 "
Diseases of lung (excluding phthisis)	... 71,	" 5 "
Tubercular diseases (including phthisis)	... 58,	" 4 "
Diseases of the eye	... 56,	" 4 "
Cardiac diseases	... 46,	" 3 "
Diseases of the nervous system	... 44,	" 3 "
Pneumonia	... 26,	" 1½ "
Ascites	... 25,	" 1½ "
Kidney diseases	... 10,	" 6 "

Fever is exceedingly common, both natives and Europeans suffer severely from it. The hospital is built on the side of a splendid hill, the building being 150 feet above a well-drained swamp at the bottom. The mission station is also built on the same hill. The missionaries, though usually free from fever, are by no means exempt. One case of blackwater fever occurred among them last year. The same fell disease has broken out several times on the adjacent hill of Rubaga, the headquarters of the Roman Catholic Mission, and on the two Government hills of Kampala and Nakasero. This disease seems to be increasing in frequency, though as yet not common. I have seen some twelve cases in the last four years—two being among natives. The variety of malarial fever which predominates almost to the exclusion of other varieties is the so-called æstivo-autumnal form. As we might *a priori* expect from this fact, the death-rate is very high. I should like to emphasise this fact because, before leaving England, I was given to understand that natives suffered very slightly from malaria, and the death-rate amongst them from this cause was slight. Whatever may be the facts in other parts of Africa, the very opposite holds good in Uganda. I find that during the four years we admitted 367 cases of fever,

of whom 46 died, a death-rate of over 12 per cent. Of course many of these were brought in in a desperate condition. The plasmodia may easily be detected by the excellent methylene-blue method recommended in Manson's "Tropical Diseases." An extended use of this method has impressed its value upon me. In over 140 consecutive cases of malarial fever from a clinical point of view, I have found the plasmodium in every one. The parasites are not easy to detect in a fresh specimen of blood, and, with $\frac{1}{2}$ oil imm. and No. 3 eye-piece, need very careful looking for. The reason of this is that they are frequently non-pigmented, at any rate in the peripheral circulation. The so-called "malignant" forms of fever are common. Quinine given hypodermically seems the best remedy. Many cases display a somewhat protracted obstinacy in yielding to quinine, though eventually it wins the day. Malarial cachexia with profound anæmia and enlarged spleen is all too sadly common.

The invasion of fever is frequently heralded by smart diarrhœa. As a broad rule rigors and shivering are very poorly marked. The malarial ulcers described in a recent number of the JOURNAL OF TROPICAL MEDICINE are very rare, though large ulcers are met with in natives debilitated from the effects of prolonged fever. I hope to contribute a subsequent article to this Journal on malaria as met with here, so I will not enlarge on the subject except to say that *Anopheles* is probably very widely distributed.

Venereal diseases may be very shortly dismissed. Syphilis is rampant everywhere, and is of course spread by many other channels than venereal ones, e.g., passing pipes from one to the other, &c., &c. Stricture is very common, and the patients usually apply at the last stage, or when extravasation or even gangrene has set in. We do numerous Wheelhouse operations and find them very satisfactory. Thanks to the wonderful constitution of the natives, even extensive gangrene of scrotum and penis by no means proves fatal, the affected parts sloughing off. The specific infectious diseases met with are the following:—Smallpox, which is very deadly, slaying its hundreds. We have vaccinated several thousands of people, and they much appreciate the safety conferred. Chicken-pox is very common. Scarlet fever, concerning which information was asked for in this Journal, I have never met with, nor strange to say, typhoid fever. It must be remembered, when I landed at the coast in 1896, it was a three months' journey by caravan to the Lake, and so sick cases would be weeded out. Doubtless with the advent of the railway this scourge of civilisation will make its presence felt. Measles are very common, and many infants die of subsequent broncho-pneumonia, their unclothed bodies being but poorly fitted to withstand the evil effects of chill. Mumps is very common. An epidemic is now raging; we had nine cases from one household. A boy came up with typical metastatic orchitis. Whooping-cough is common. I have not met with dengue, cerebro-spinal meningitis, or diphtheria, though I remember one case curiously like the latter. It was in a child who had sore

throat and enlarged cervical glands followed by squint, but subsequently retraction of the head and a continual screaming cry set in. It was probably a case of tubercular meningitis. No *post mortem* was obtained, as she made a perfect recovery. Erysipelas and pyæmia are met with, but I have not seen a case of cholera, yellow fever, anthrax, or hydrophobia. Bubonic plague is endemic, and often mild sporadic cases occur. From time to time epidemics sweep over parts of the country and kill hundreds. Thus it was very rampant in and around the capital after the wars of 1889 and 1890. A sharp epidemic occurred in Buddu about 1896, and more recently it was carried by native traders to some of the islands of the lake. In the village of Kitengule, close to the southern border of the Protectorate, it killed off about 75 per cent. of the inhabitants. The German doctors who investigated the outbreak and made *post mortems* discovered the typical bacillus. I have only had six cases in the hospital, they were all admitted within eight days, during May, 1899, and all recovered, although three were desperately ill. Dysentery is frequent, but of the mild catarrhal type; we find magnesium sulphate most efficacious. I have had three cases of tetanus under my care. Two occurred in men with bullet wounds; two proved fatal; his friends took away the other just when he seemed recovering, and I could not hear what became of him. Tubercular diseases are common; phthisis, tubercular joints, caries of the spine, psoas abscess, scrofulo-derma, tubercular glands, &c. They accounted for 71 (5 per cent.) out of the 1,500 enumerated above. The phthisis is very chronic, probably owing largely to the open-air life these people lead. I never saw a case of "galloping consumption." Leprosy is said to be common in Bunyoro (N. Uganda); I have only seen a very few cases here. Rheumatic fever and arthritis deformans are both met with, the former reacting typically to sodium salicylates and presenting the usual fugaceous effusions into joints. In this connection it may be mentioned that cardiac organic disease is common. Gout must be very rare, I have not seen a case. It must be remembered that the bulk of the people can very seldom obtain any meat. Diabetes is rather uncommon and very fatal, but we had one remarkable case of apparently permanent cure. Rickets is never seen, the children are often suckled up to 15 months or even 18 months. The Baganda have a curious idiosyncrasy towards mercury, even small doses of this drug giving rise to severe salivation. Thus 5 grains of calomel is almost sure to cause ptyalism, even the 1 grain contained in a single Livingstone Rouser may set up a somewhat severe stomatitis. A native boy to whom a European once unwittingly gave 10 grs. of calomel came to the hospital suffering from severe hæmorrhage from a terribly ulcerated mouth; he nearly died. Pharyngitis and adenoids are common. The teeth are splendid as a rule, yet we have extracted over 300 in the past three and a half years. The various forms of dyspepsia, diarrhœa, appendicitis, and herniæ are met with much as at home. We have only seen one case of intussusception in a man.

Malignant disease is common—sarcoma of the

jaws, upper and lower, is perhaps the most frequent form. I enclose a photograph taken by the Rev. R. H. Leakey for me of a native princess in Koki suffering from sarcoma of the lower jaw. She died about ten months after the photograph was taken. Carcinoma of the œsophagus, colloid cancer of the ascending colon, carcinoma of the uterus, squamous epithelioma of the cervix, epithelioma of the penis and of the lip, and melanotic sarcoma of the hand, and a melanotic cyst of the right serratus magnus muscle, are some of the forms met with; also chondro-sarcoma of the parotid region and scirrhus of the breast. Malignant diseases are, however, not nearly as frequent as they are at home, and appear to run a slower course. Thus a young man whom



I operated on early in 1897, removing a chondrosarcoma of the neck, the tumour being 10½ inches round, is still alive (March, 1901) and able to do a long day's work, though the tumour has grown to a great size, and lately he has some hæmoptysis and dysenteric stools.

We have had over 150 cases of bullet-wounds to deal with, including compound comminuted fractures of almost every bone in the body. These cases, if not killed outright by shock or hæmorrhage, nearly always recovered. Catarrhal jaundice and jaundice complicating fever are not rare. Gall-stones I have never seen. Ascites due to hepatic, cardiac, malarial and tubercular (tubercular peritonitis) affections are common; huge malarial spleens prevail; Bronchitis, phthisis, and pneumonia are common. Of the latter we admitted twenty-six cases of which eight died—a mortality of over 30 per cent. Here,

again, they brought us several cases almost *in extremis*. One developed meningitis. Fibrous pleurisy is common, pleurisy with effusion is rare. I only met with one case of empyema due to a spear wound. One case of malignant disease was associated with hæmothorax. Valvular diseases of the heart are common. I only remember one case of pericarditis with effusion verified by *post mortem*. Atheroma and aneurisms are very rare, though syphilitic endarteritis obliterans is probably common. Nephritis may be taken in this connection. It is distinctly rare except as a complication of malarial fever. Only ten cases out of the 1,500 were nephritic. Here, again, the vegetable diet of the people must be remembered. High tension pulses are not often met with.

Goitres are common; albinos are not very uncommon.

Amongst women ovarian tumours are met with, fibromata of uterus are very common, and retroflexions of uterus. Stone in the bladder is practically unknown. I have twice met with a phosphatic stone impacted in the urethra, and one of these cases was in an Indian. As regards diseases of the nervous system, neuritis, especially post-malarial, is met with and facial paralysis. Myelitis, paraplegia, infantile paralysis are not uncommon. In spite of the almost universal spread of syphilis I have never met with a case of locomotor ataxy or general paralysis of the insane. Spastic paraplegia is met with, but progressive muscular atrophy has not been noticed. Sciatica is met with. In one obstinate case stretching the nerve produced a permanent cure. Hemiplegia is frequent, and found in connection with kidney disease, embolism, and also with syphilitic disease of the arteries, and as a sequela of malaria. In both the latter classes recovery seems not infrequently to take place. I have seen several cases of meningitis, one of chronic hydrocephalus and none of multiple sclerosis. Epilepsy is very common; the natives have a great horror of it and think it contagious. Hysteria is not very rare. Chorea is met with, and paralysis agitans. I have seen one case of convulsive tic. Neuralgia, specially malarial, is common. Malarial eye-affections are common, total blindness sometimes supervening from severe retinitis or choroiditis. Cataracts are common and occur at all ages. Corneal ulcers are very common, and phlyctenular conjunctivitis. Trachoma is exceedingly common in pure-blooded natives, a point worth remembering in connection with the discussions on this point. Sunstroke is very rare. Dementia and mania are the commonest forms of insanity met with; the former often follows severe fever. Suicide is frequent, often for what we should call very trivial causes, *e.g.*, inability to pay tribute, discovery of theft, &c. Flat foot is met with, but scoliosis and kyphosis are rare. Innocent tumours are common, lipoma, fibromata, nævus, enchondroma, osteoma, sebaceous and dermoid cysts. Skin diseases show a rich profusion, but eczema, save for the specific form, is rare; so is psoriasis. The parasitic forms flourish—ringworm of the body, scabies, impetigo, &c. We have had three cases of pemphigus, two of whom

died. Of the more especial tropical diseases not mentioned above, I have not met with beri-beri. Sleeping sickness is said to be common in Busoga, to the east of Uganda. We have only had two cases admitted into the hospital. In both of these I easily found *filaria perstans*; one died, and a *post mortem* showed nothing very characteristic. The pituitary body was large, but not, I think, pathologically so. I have only once seen hepatic abscess in a Muganda. It is common among the Nubians. Dr. Moffat, P.M.O., of the Government Medical Service, tells me he frequently sees yaws amongst the Nubians, &c., but though I have been on the look out for it, I have not seen an undoubted case amongst the Baganda. We have had one case of oriental sores. Elephantiasis is very common, I have met with two cases of *filaria diurna*, and three of *filaria perstans*, and one of *filaria medinensis*. Jiggers (chiggers) are universal; they only appeared in this country in 1891 having apparently been carried across Africa by Stanley's last expedition. This expedition did not actually enter Uganda, but many Baganda who had been driven out of their country by a revolution met with Stanley's expedition and brought back the jiggers to Uganda. Coming up country in 1896 we met the jiggers just before we got to Machakos. Following the caravan route they slowly made their way down to the coast, which they reached about 1899. Till the natives realised their nature they did great damage and caused the loss of many toes, &c. Now the natives take far better care of themselves and so suffer less. Climatic bubo is common; I have seen two cases of goundou and one typical case of ainhum.

In conclusion, I should like to bear my testimony to the great usefulness of the JOURNAL OF TROPICAL MEDICINE. When I left England in 1896 I had only Davidson's "Tropical Diseases," and hailed the publication of the above-mentioned Journal with great pleasure; I think it admirably fulfils its work of helping the isolated medical man in tropical climates.

A CASE OF TERTIAN BENIGN WITHOUT FEVER. WITH REMARKS ON THE "PERIOD OF LATENCY" IN MALARIA.

By Staff-Surgeon P. W. BASSETT-SMITH, R.N.

Lecturer on Tropical Diseases, Haslar.

(Published by kind permission of the Medical Director-General.)

In the treatment of malarial disease, the medical officer, frequently in the tropics, less frequently at home, comes across cases which present anomalous conditions. We now know that many of those peculiar fevers so common in hot climates, which used generally to be classed as malarial, are not due to the malarial parasite at all, and one also occasionally meets with cases where the parasites are present in the blood, yet there is no fever (apart from the algid forms of pernicious attacks), which Manson believes is either due to the presence of only a minimum number circulating in the blood, not numerous enough to give rise to sufficient toxin to cause fever, or to the gradually produced im-

munity of the subjects. Lately we have had in the R.N. Hospital at Haslar an interesting case in which the patient is stated not to have had any fever for over a month, and during the time in Haslar, though the temperature was taken every two hours, it did not rise above 98.8, but whose blood showed at first quite a considerable number of well-marked tertian benign parasites of different ages for several consecutive days. These were traced from the early active, non-pigmented, amœboid condition to parasites completely filling the enlarged corpuscle, and containing an abundance of fine pigment, but no sporocysts were ever detected. The original disease was probably contracted at Colombo in June, 1900. From that time he suffered from repeated attacks of "ague" on the China station, being under treatment at Wei-hei-Wei and Yokohama hospitals, necessitating his being invalided home, his last attack being in January, on passage to England. He was admitted to Haslar in March, when the above condition was found; the spleen was slightly enlarged, there was considerable anæmia, but he stated that he felt quite well. Under rest, warmth, good diet, and arsenic and iron, the parasites apparently disappeared—at least none were found five days after admission.

The points of special interest are:—(1) The absence of fever; (2) the presence of well-marked tertian parasites in considerable numbers; (3) the absence of sporocysts in the peripheral blood; (4) the disappearance without administration of quinine.

The lesson one learns is that systematic examination of the blood is necessary after malarial attacks, even when clinically there seems no evidence of active infection being present.

The presence of parasites in small numbers, without fever, bears very importantly on the vexed question of the latent stage of malaria; for if the parasites still remain circulating in the blood, though in too small numbers to produce any marked clinical symptoms, and requiring much patient microscopical examination to detect them, yet on the person being subject to any severe chill, &c., there may be a great increase of parasites and a fresh paroxysm occur, the patient having thought himself cured.

The theory of apparent cure is ably put forward by Dr. D. Gray, in a paper communicated by Dr. C. W. Daniels to the JOURNAL OF TROPICAL MEDICINE,* in which he draws attention to the protracted periods during which the parasites appear to be latent, and points out that for the "period of latency" all that is necessary is that the natural check to the multiplication of the parasite should be sufficient to keep them in small numbers only; and he also states, "one parasite per c.m. would probably escape detection with careful examination, yet with that number there would be some millions in the total blood."

Major R. Ross, F.R.S., also holds this view with regard to the periods of latency.

Dr. Moffat, C.M.G., of Uganda,† says: "I have long held the view that probably a certain number

* "A Case of Quartan showing Cyclic Variation of Parasites," April 1, 1901.

† JOURNAL OF TROPICAL MEDICINE, March 15, 1901.

of parasites are necessary in each case for the production of a manifest malarial attack. If the parasites are not sufficiently numerous no actual attack will occur, but the patient nevertheless suffers a certain amount of injury." Whether this condition of *apparent* cure may apply to those cases which after *many* months relapse, is a point which requires further elucidation.

The karyochromatophilic granules, or primitive forms of Plehn, as a source of latency have not yet been satisfactorily confirmed.

It is interesting to note that quinine, although it cures the fever, does not always entirely kill off all the parasites even in benign infections, for the above patient had taken the drug fairly constantly while in China and on the way home. This is a point of some importance.

RELAPSING FEVER IN SUMATRA.

By J. C. GRAHAM, M.D.

Deli, Sumatra.

THE occurrence of a case of relapsing fever on the east coast of Sumatra is an important event in the history of disease. It is the first case ever recorded here, and was imported on the 10th of this month by an immigrant Chinese coolie from Swatow. The man had high fever, tenderness over both hypochondria, pains in his joints and the muscles of the leg, besides severe headache. The ocular conjunctivæ and the skin generally were icteric. Not suspecting relapsing fever, I examined the blood for malarial parasites, using Romanowski's double stain. There were no malarial parasites, but the specimen teemed with spirilla Obermeieri.

The course of the fever was not influenced by quinine in 1.3 gramme doses daily; but subsided to 35.6 degrees C. on the sixth day, to become normal the day after. I am now treating him with iodide of potash empirically, on the supposition that, as this substance is said to arrest the virulence of the spirillum in inoculations, it may have an inhibitory action on the return of the fever.

QUININE PROPHYLAXIS.—"I am still of opinion that the best prophylaxis is the daily use of a small dose of quinine (3 to 5 grains) throughout the summer (May to November), but I am very sceptical as to whether it will ever be possible to persuade the bulk of the population to adopt this course. I certainly think the better educated amongst the community might in this instance do worse than follow medical advice, though possibly they will prefer to go on expecting Government to kill off all the mosquitoes regardless of cost, which idea seems at present to have taken hold of most. I may say that this course of treatment does not prove in any way injurious."—Dr. Bell, *Hong Kong Civil Hospital Report*, 1901.

MALARIA IN A CHILD OF THREE WEEKS. By J. C. Josephson, M.D., Baltimore, Md.—Baby Rosenfeld became ill when a week old. His mother had lived in a malarial district in the South, and had had several attacks, the last one on the eighth puerperal day. Ever since then the child had been ailing. Every afternoon, about three or four o'clock, he would become blue and have a slight spasm. Then he would have a fever. He was very restless, took the breast badly, was pale and small, and had a very marasmic look. In the morning there would be no fever. I first saw him about the twelfth day of his illness on November 30, 1900, in one of his typical attacks. The child was pale and bluish, and had a slight spasm of the muscles of the face. The breathing was jerky. The temperature was 102 degrees F. The spleen was much enlarged. He had been treated for consumption since he first became ill, by a certain ignorant but very popular practitioner, one of those "years-of-practice" men that we have here. There was absolutely nothing abnormal in the chest. The regular periodicity of the attacks, the mother's history, and the enlarged spleen convinced me that I had to do with a case of malaria, and five days' dosing with quinine—at first 4 grains a day and later 2 grains—cured the child entirely, and he has been flourishing ever since.—*Medical Record*, April 20, 1901.

THE TREATMENT OF MOSQUITO BITES.—M. Manquat expresses his opinion that tincture of iodine and formaldehyde are the most useful drugs, while the usefulness of menthol should not be overlooked. According to M. Manquat, tincture of iodine applied at once after the mosquito has bitten causes the abortion of the symptoms in a period varying from ten to twenty minutes. For the face, wrists, ankles, and other delicate cutaneous surfaces, the following formula should be applied:—

R	Formaldehyde, 40 per cent.	..	..	5 parts
	Alcohol	} of each	..	.. 10 "
	Water			

M.

It should not, however, be left on long, but should be repeated lightly and not to such a degree as to cause irritation or smarting. Another application, useful for slight insect bites, is 4 or 5 per cent. menthol in eau de Cologne.—*Bulletin Général de Thérapeutique*, November 15, 1900; and *Archives de Médecin et de Pharmacie Militaires*, April, 1901.

THE ADMINISTRATION OF QUININE.—It may be quite safely held that any intermittent fever that resists quinine, properly given, for three or four days, is not due to malarial infection. In an ordinary case of intermittent fever the average dose of the drug may be 10 grains, preferably given when the sweating stage begins. Subsequent to this 5 grains should be given three times daily for a week or more, and at intervals of several days thereafter two or three doses a day may well be used. It is generally better to use a soluble salt, in solution, or perhaps the common sulphate in capsules, than to depend upon pills, granules or tablets.—*Clinical Review*, May, 1901.

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or three headings under which replies may be classed.

First, are the children of natives liable to naso-pharyngeal adenoids? if so, is the ailment (a) common; (b) rare; (c) or fairly prevalent? Second, are the children of European parents residing in the tropics liable in any degree to adenoids? Third, are persons of mixed (European and native) parentage more, less, or equally liable to adenoids with either the European or native? The etiology of adenoid growths in the pharynx is at present undecided, and many questions arise in connection with the ailment. Has it a racial, a climatic, or a hereditary basis of origin? Is its frequency determined by the scale of civilisation? Is it a disease of recent origin dependent upon modern modes of living? All these and many more questions attach themselves to the subject, and some of them at least might be answered by ascertaining in some degree, at all events, a knowledge of the geographical distribution of the complaint.

THE

Journal of Tropical Medicine

JUNE 1, 1901.

DO ADENOIDS (NASO - PHARYNGEAL) OCCUR IN NATIVES OF TROPICAL COUNTRIES?

THIS is a question which is frequently asked of medical men returning from tropical countries by Laryngologists and others in Britain.

The question was put some years ago now by a Danish physician and answered by a few observers in the affirmative. All, however, seem to agree that adenoids are much more rare in warm climates than in the more temperate regions. Whether these statements can be regarded as scientifically correct or not remains to be proved, and we are asking the question at the request of several men interested in laryngology. Photographs of cases would be welcomed, and we hope that a general reply to this query will elicit information from many sources. There are two

THE LADY MACGREGOR PRIZE.

WE have to cordially thank Lady Macgregor for her liberality in bestowing a prize of £10 to be competed for by medical men resident in malarial countries. The subject Lady Macgregor has chosen for the prize is "The best Method of the Administration of Quinine as a Preventive of Malarial Fever." The eminently useful and practical end to be attained by an elucidation of this subject will commend itself to every one, and we hope to gather a store of knowledge from competitors in many regions. It is a matter upon which most practitioners must have an opinion one way or another, and therefore the competition may be truly said to be an open one. The letter announcing the subject of the prize is dated from Government House, Lagos, West Africa, a fact which clearly indicates the personal interest Lady Macgregor takes in the work of her distinguished husband. No man is more conversant with the requirements of the tropics from a medical and sanitary standpoint than the present Governor of Lagos, and the selection of

the subject for the prize by Lady Macgregor adds another to the many debts residents in the tropics, and medical men in particular, owe to Sir William and Lady Macgregor. The best way of acknowledging Lady Macgregor's liberality and her concern for the dwellers in warm climates, whether European or Native, will be by as many as possible sending in their opinions and experiences on the subject she has wisely chosen to be elucidated.

THE POLYCLINIC FESTIVAL DINNER.

MR. BALFOUR ON MEDICAL SCIENCE.

At the Festival Dinner of the Post-Graduate College and Polyclinic, held on May 22, 1901, at the Hotel Cecil, The Right Hon. A. J. Balfour, M.P., presiding, a large and influential gathering testified to the importance of post-graduate work for medical men. Close upon 500 guests sat down to dinner, and the galleries were filled and enlivened by the presence of a number of ladies.

The Polyclinic, although it has only completed the second year of its existence, has become an essential feature of medical education, and its continuance and success is assured. Medical practitioners who are in earnest, and who do not wish to fall behind in the race and competition of life, must avail themselves of the instruction the Polyclinic affords. Medical men from the more distant parts of the empire, and foreign medical men, find in the Polyclinic what may be best described as a Club for Medical Instruction; for whilst the building affords some of the conveniences of a club, the clinics and selected lectures are of a kind to convey the instruction to medical practitioners in the manner and method acceptable to their requirements.

The attendance at the Polyclinic of some fifty to eighty busy practitioners from four to five o'clock every afternoon testifies to the desire for knowledge of the post-graduate, and to the excellence of the teachers and teaching.

Supporting the Right Hon. Arthur J. Balfour, M.P., LL.D., chairman, on the right were His Grace the Duke of Marlborough, P.C.; the Right Hon. Lord Kelvin, LL.D., F.R.S.; the Right Hon. Lord Strathcona and Mount Royal, G.C.M.G.; Jonathan Hutchinson, Esq., LL.D., F.R.S.; W. Knox D'Arcy, Esq.; A. Bence Jones, Esq.; Sir John A. Cockburn, K.C.M.G., M.D.; Sir James Crichton-Browne, LL.D., F.R.S.; Sir Albert K. Rollit, M.P., LL.D.; Sir Henry Burdett, K.C.B.; Mr. Sheriff Lawrence, M.P.; Sir William R. Gowers, F.R.S.; Timothy Holmes, Esq.; Professor Clifford Allbutt, LL.D., F.R.S.; the Hon. Alfred Lyttleton, K.C., M.P.; His Honour Judge Sir Lucius Selve; Dr. Bowles; the Rev. Canon Ainger; M. A. Goldschmidt, Esq.; Dr. Stephen Mackenzie; Vice-Admiral G. Morant; Dr. Patrick Manson, C.M.G., F.R.S.; Sir T. Lauder Brunton, LL.D., M.D.; Dr. Wallace, and Dr. James F. Goodhart. To his left

were Sir W. H. Broadbent, Bart., K.C.V.O., F.R.S.; the Right Rev. the Lord Bishop of London; the Right Hon. Lord Balfour of Burleigh, K.T.; the Right Hon. the Lord Mayor; Alderman Thomas Crosby, M.D.; Sir Joseph Fayrer, Bart., K.C.S.I., F.R.S.; Sir Walter Foster, M.P., M.D., LL.D.; Admiral Sir Richard Tracey, K.C.B.; Sir John Batty Tuke, M.P., M.D.; the Viscount Gort; Sir Hermann Weber, M.D.; Sir Robert M. Craven, F.R.C.S.; Surgeon-General Harvey, C.B., I.M.S.; the Ven. Archdeacon of London; Professor Ray Lankester, LL.D.; C. Rube, Esq.; Sir Alfred Swayne Lethbridge, K.C.S.I.; Sir James Blyth, Bart.; Malcolm Morris, Esq.; Alfred Beit, Esq.; E. Paris Singer, Esq.; Sir Sydney Sheppard, K.C.M.G.; Lionel Phillips, Esq., and Dr. Alfred P. Hillier.

Presiding at the several tables were Dr. Fletcher Little, supported by Benjamin A. Lyon, Esq., Edward Atkin, Esq., and Surg. Lt.-Col. Oswald Baker. Dr. St. Clair Thompson, supported by Dr. Douglas Kerr, Colonel Alfred Clarke, R.A.M.C., Insp.-Gen. Alex. Turnbull, T. R. Jessop, Esq., and Dr. H. Radcliffe Crocker. James Cantlie, Esq., supported by Sir William Robinson, G.C.M.G., Sir Arthur Trendell, K.C.M.G., the Hon. E. R. Belilos, C.M.G., N. J. Ede, Esq., T. Pridgin Teale, Esq., and Lieut.-Col. Probyn, L.C.C. Dr. Theodore Williams, supported by Lieut.-Col. C. M. McCartie, M.D., Dr. A. L. Galabin, George Cowell, Esq., Dr. A. Macfadyen and Johnson Smith, Esq. Dr. Guthrie Rankin, supported by the Hon. R. H. Lyttleton, Lieut.-Col. Babbie, V.C., C.M.G., S. Loewe, Esq., Dr. D. M. Macle hose, and Surg.-Gen. W. B. Beatson. Capt. A. E. Hayward Pinch, F.R.C.S., supported by Edward Treacher Collins, Esq., Dr. Dawson Williams, William Watson Cheyne, Esq., and Morgan Finucane, Esq. Dr. Seymour Taylor, supported by Sir Thomas Roe, M.P., W. Francis Roe, Esq., Cecil Harmsworth, Esq., H. E. Juler, Esq., Dr. Isambard Owen, John Tweedy, Esq., and Dr. J. Burney Yeo. Sir William Kynsey, K.C.M.G., F.R.C.P., supported by Lieut.-Col. W. H. Thornhill and Dr. J. Mitchell Bruce. Dr. William Cubitt Lucey, supported by Dr. Boyd Joll and Frederic Eve, Esq.

In proposing the toast of "The Polyclinic," Mr. BALFOUR said:—

It is now my duty to propose the toast of the evening, and I can assure you that I do it with deeper feelings of responsibility than, I think, usually oppress a person in my position, because I know that I am pleading a cause which has not behind it any great wave of popular feeling or emotion, a cause which does not readily or immediately appeal to the man in the street, and yet a cause in which the whole community are deeply and profoundly interested; a cause which touches every one of us human beings, and will affect not only our own happiness, our own lives, and the happiness and the lives of those nearest and dearest to us, but the future generations whom it is our business to aid. The toast I have to propose, as you will know, is that of "The Polyclinic." The Polyclinic is in this country as yet a young institution, though well known and fully recognised in almost every other civilised country in the world.

THE AIMS OF THE POLYCLINIC.

It is an institution with many sides of utility and activity. I will not attempt to dwell upon them all, but there are three which especially appeal to me and which, I venture to think, will especially appeal to you when I attempt to describe them and to tell you in what their chief characteristics consist. The first side of the activity of this institution may be described, perhaps, as directly philanthropic—that is to say, it brings directly home to those men in need of it, and to those who could not otherwise afford it, medical assistance, medical advice, and medical knowledge which would not under other circumstances be at their command. The Polyclinic does something which the great hospitals of this country could not do and do not attempt to do. There are vast sections of our population who can avail themselves and do avail themselves of the services of the general practitioner but who, in cases of extreme difficulty when their medical attendant would, were they persons of means, recommend them to go to some expert consulting physician, have not the resources which would enable them to take that course. This is a want not supplied by our hospitals, which cannot be supplied by our hospitals under their existing organisation in any large measure; it is supplied by the Polyclinic. The Polyclinic does give, and hopes to give in ever-increasing measure, to the class of which I speak that expert medical advice which at present is at the command only of the well-to-do. I cannot imagine a charity, in the ordinary sense of the word, which ought more to command the generous support of those who are able to give it. And yet I venture to think that what I may describe as the directly charitable or philanthropic side of this institution is not its most important side. It is not the form of its activity which I think will produce the most far-reaching benefits to mankind, for, in addition to this consultative expert medical opinion which it is ready to afford to those who could not otherwise obtain it, the Polyclinic is designed to give opportunities of medical education to those who have, indeed, qualified as medical students, who have gone through the ordinary courses which qualify a man to practice, who are, perhaps, in a great, and deservedly great, practice, but who have little opportunity of keeping themselves abreast with the ever-growing mass of medical knowledge. Remember what is the life of a general practitioner in a great practice. I do not believe there is a harder life. I am sure there is no more beneficent life led by any set of men upon the face of this earth. It is a hard day-to-day struggle. Ah! a day-to-day and night-to-night struggle with disease; no certainty of repose, no habitual opportunity of study, constant aid to the poor, to the needy and to the suffering—aid in many cases but ill-remunerated, aid which calls forth constantly and steadily an amount of unknown and unrecognised self-devotion which, I am sure, must move the heart of anybody who thoroughly realises it. Now, to these hard-worked and over-worked general practitioners comes the duty of attempting to make themselves familiar with the latest researches in medical science, the accumulated wealth of medical experience, the vast mass of information contained in medical and other scientific journals concerning the

last researches of medical science. How is it to be done? How can it possibly be done under existing conditions? It cannot be done; and the Polyclinic has set itself to work to give to these men, in their rare opportunities of leisure, on the easiest and the cheapest terms, an opportunity of bringing themselves abreast with medical science in its latest development, of coming into personal contact with the leaders of medical thought, and of carrying back into their own region of special activity this augmented knowledge which it were hardly possible for them to obtain under the existing conditions of stress and strain in which they live. Think what this means, not to these medical gentlemen themselves, but to their innumerable patients. Think how much an institution on the lines of the Polyclinic developed, as I hope to see the Polyclinic develop, may do, not for the education of the medical student, which is amply provided for, but for the education of the medical student after he has become a professional man, when he is, perhaps, as much or even more in need of those educational advantages for which at present no machinery exists in these islands. There is yet a third branch of the activity of the Polyclinic to which I would venture to call the attention of this audience, and it is perhaps the branch which we in this country are most apt to neglect.

THE GROWTH OF MEDICAL KNOWLEDGE.

I have spoken to you of the growth of medical knowledge, and surely that is one of the most remarkable scientific facts of the last half-century. I do not commit myself to the year, but it is, broadly speaking, in the last half-century that the medical profession have become, not merely admirable masters of the art of healing, but acquainted, not empirically merely, but scientifically, with the causes of many of those maladies with which they have to deal. In reality it is only in the last half of the last half-century that we have realised to the full extent how much these maladies under which mankind groans are due, not to the natural and inevitable decay of the human organism, but to what is literally and absolutely an external parasitic invasion. So far as I am able to judge, that view of a large number of the real scientific causes of so many of the maladies of humanity is not diminishing, but is increasing in its scope; and, while there is, so far as I know, no example in which a disease originally supposed to have a parasitic origin has now been found to have some other origin, every day the leaders of the medical profession are more and more coming to the conclusion that the diseases whose parasitic origin was never even suspected are nevertheless due to invasions of the kind I have endeavoured to describe. I need not say that in such a company as this I am not going to attempt to discuss the effects which this extraordinary discovery has had upon medical science; I am not going to show how, in the first place, doctors have endeavoured to meet this invasion by a general strengthening of the organism by what are called principles of hygiene, nor how they are prepared to meet it by assisting the natural forces of the body to meet the invader by appropriate medicines, or by such anti-toxins, as serum, that therapy has placed

at their disposal, nor how they are even educating the body to meet this invasion by the various forms of vaccination that have been adopted and are from day to day increasing.

THIS COUNTRY LAGGING BEHIND.

I should be going beyond my depth were I to deal with these important aspects, these vital aspects, these leading aspects of the medical science of to-day, and I have only mentioned them in order to lead up to this question, which I put to you in all solemnity and seriousness. Can we honestly say that in this great development of medical knowledge and therapeutic science this country has taken the leading part it ought to have taken? I speak in the presence of gentlemen whose names are of European fame, and who certainly have done their part in the spread of medical knowledge and in the furthering of medical research. I do not forget that in perhaps the two branches of medical advance which have done most to save human life and to diminish human pain—I mean the use of anæsthetics and antiseptic surgical treatment—this country may have a claim to have taken the lead. Happy will be the century on which we are entering if other discoveries are made which will do so much to increase human happiness and to diminish human suffering. And yet, when I have made all allowance for those great claims on the gratitude of the world which I think we possess, it remains the fact that, so far, at least, as I am able to judge, we cannot say that as compared with Germany, or with France, or with Italy, we have done all that, perhaps, we might have done as pioneers of medical discovery. I may be wrong. It is only a personal opinion, given for what it is worth, but I fear that any investigator who set himself in a perfectly impartial spirit to examine the respective claims upon the gratitude of mankind of these great nations would not be able, in all honesty and fairness, to say that we had any claim to take the lead. Now, if that is so, do not you think we—the public, the unprofessional and the unscientific public—are in part to blame for that state of things? Do you think that we have shown a recognition of the duties which fall upon us in this matter? We are proud to say that in this country we leave to private enterprise and to private benevolence duties which in other and less fortunate countries are entrusted to the Government. Yes, that is true; but if that policy is to be successful you must have the private enterprise and the private benevolence, and have we shown the possession of those great qualities in this particular to the extent that we ought to have done? Personally I grieve to say I have no doubt as to the answer that should be given. I do not believe that any man who looks round the equipment of our Universities or medical schools, or other places of education, can honestly say in his heart that we have done enough to equip research with all the costly armoury which research must have in these modern days. We, the richest country in the world, lag behind Germany, France, Switzerland and Italy. Is it not disgraceful? Are we too poor, or are we too stupid? Do we lack the imagination required to show what these apparently remote and abstract studies do for the happiness of

mankind? We can appreciate that which obviously and directly ministers to human advancement and facility, but seem, somehow or another, to be deficient in that higher form of imagination, in that longer sight, which sees in studies which have no obvious, necessary, or immediate result the foundation of the knowledge which shall give far greater happiness to mankind than any immediate, material, industrial advancement can possibly do; and I fear, and greatly fear, that, lacking that imagination, we have allowed ourselves to lag in the glorious race run now by civilised countries in pursuit of knowledge, and we have permitted ourselves to far too large an extent to depend upon others for those additions to our knowledge which surely we might have made for ourselves.

AN INTERNATIONAL COMPETITION.

It is the result of my unfortunate profession that I am constantly engaged in discussions and conflicts, which at the worst have a party significance, but which at the best have but a national significance. But the cause I plead now is not the cause of a party nor of a nation, but the cause of mankind at large. Every discovery which is made in the laboratory in Germany, France or Italy, is the possession not of those countries, but of the whole world. Let us not be backward in this great international competition, which surely may be said, in some senses, to balance with that yet more costly and destructive competition in armaments, and, it may be, in commerce. Here, at all events, the interest of all nations are at one. Here there should be no undue rivalry, or, if there be, the only rivalry we should permit is what nation should add most to that scientific knowledge on which, on more than the efforts of statesmen, politicians, and soldiers, depends the future progress and happiness of mankind. These are feelings which I have long entertained, and have taken such opportunities as I could to express, but which, I think, are not sufficiently realised by our fellow-countrymen. I hope that, at all events, the result of this evening's proceedings may be that the Polyclinic, which is devoted to the great cause for which I have endeavoured to plead, may obtain from those who can give it that assistance which is required to make it the useful institution which it potentially is, and only requires your aid fully and perfectly to become. I hope I have not pleaded in vain. At all events, the cause is one in which I firmly believe, and if this country allows itself to be passed in this race I should regard it as a greater national calamity than a lost market here or some national *contretemps* there. I should feel the higher life of the nation had proved itself inadequate to our national necessities, and that we, who certainly of all nations in the world are able to provide adequate means for our men of science to develop those great capacities which in so many branches of science have made us the leaders of thought for all mankind—that we have been failing shamefully in our duty if we allow ourselves to be surpassed in this particular branch by every civilised nation in the world. I hope I have said enough to justify me in asking you to drink with enthusiasm and subscribe with generosity to the great cause of medical science which I have pleaded to-night.

The toast was drunk with enthusiasm.

ANNUAL MEETING OF THE COLONIAL NURSING ASSOCIATION.

A LARGE and fashionable audience was present at the fifth Annual Meeting of the Colonial Nursing Association, which, by the kind permission of Lord and Lady Londonderry, was held at Londonderry House, Park Lane. Among those present were Sir Hubert Jerminham, Sir Archibald and Lady Alison, Sir Henry Stanley, Earl Grey, Earl of Westmeath, and many others.

EARL GREY occupied the Chair. He opened the proceedings by saying that it gave him great pleasure to see such a large audience, which proved how great an interest was taken in the Colonial Nursing Association. Mrs. Francis Piggott, who deserved the deepest gratitude of all English men and women, was the first person to whom the idea of providing nurses for our sick abroad had occurred, and it was owing to her own sad experience in Mauritius of seeing three young Englishmen succumb to disease from the lack of attention that struck the key-note of this Association. Mr. Chamberlain had taken the deepest interest in the Colonial Nursing Association, and Mrs. Chamberlain had been instrumental by her great and untiring efforts in raising £3,000. The sum required was £5,000, and the Chairman expressed his opinion that it ought to have been forthcoming in the furtherance of so noble a cause.

Earl Grey expressed his appreciation of the honour conferred on him in being made President of the Association, and referred with deep regret to the death of the first President, Lord Loch. He said that Lord Loch has been the first to appreciate the importance of this Association, and he first realised the usefulness thereof to the Colonies and the Empire at large.

The Chairman added that he was proud to be an Englishman, and to belong to a country from which the young men were ready to go anywhere and everywhere for the sake of the Empire. It was the mission of the Colonial Nursing Association to help to save this valuable material by sending across the seas trained nurses. The Colonial Nursing Association was desirous of guaranteeing to every nurse sent to the Colonies a salary of £60 per annum and free passage, also to advance money if necessary. Earl Grey wished to acknowledge the receipt of two donations, one of £200, the other £21, as also a cheque of £5 from Lord Crawshay.

EARL ONSLOW said he associated himself with Earl Grey in thanking Mrs. Piggott for her untiring efforts in the interest of the Colonial Nursing Association. He was happy to think she would still remain Hon. Secretary, and would give her invaluable services in the choice of nurses. Earl Onslow said that as regards the progress of medicine in general up to the present, though it was said that surgery had advanced more rapidly than medicine, the nursing of the sick, if comprised under the latter term, had made rapid strides in recent years. All those who had suffered from typhoid—or enteric as it is called in South Africa—were aware of the comfort, and appreciative of the ability

and kindness of our nurses, and of the noble women who risked their lives for the comfort of our sick and wounded in tropical countries, as exemplified in the present lamentable war.

Contumely had been heaped on some ladies who had gone to South Africa to help the wounded, and they were classed with grasshoppers, flies and other plagues of Egypt; it was said of them that not being able to don khaki and go to the front to see the "fun," they donned cotton instead for the same motive. It was a pity to speak thus of ladies, who were never lacking in courage to face a hot climate and help to combat disease.

By the kindness of the Editor of the *North American Review*, the Committee were enabled to republish, for distribution in leaflet form, Mrs. Chamberlain's admirable article on the history and work of the Association, in which she has taken the kindest interest; personally, also, she has worked hard and should receive the unstinted gratitude of all British men and women. In 1899 only 37 nurses were sent abroad, this year 67 had gone. Imperialism was now a fashion, but it should be a creed, and should consist, not alone in fighting for one's country, but in the upholding of such principles as the abolition of slavery, promotion of Christianity, and the support of the Colonial Nursing Association.

Sir CUTHBERT QUILTER said, in seconding the adoption of the report, he had little to say about accounts which were ably managed and excellently audited by a distinguished firm. He wished to say something about the passages of nurses abroad. Formerly the great steamship companies made a reduction for nurses, but he was sorry to say the P. and O. Company had withdrawn this trifling concession, and their example had been followed by the North German Lloyd. This was a sorry way of showing appreciation of the good done by nurses in ports to which these Companies owed much of their prosperity, and he must add that not alone were nurses now charged full fare, but an additional charge of 10 per cent. was made for the rise of coal! He appealed for more annual subscriptions. They had only seventy-four regular annual subscribers, bringing in £173 a year. If we are to be Imperial in the best sense it should be an object to help to save life in trying regions.

Col. Sir JAMES WILLCOCKS said he would like to say a few words about West Africa in connection with nurses. They were indeed badly wanted there. When he first went on the Niger, there were no houses and little food; they were, however, lucky in having nursing sisters to save life. Officers in that terrible climate came out of hospital only to return, but the nurses were never ill—they had no time. Col. Sir James Willcocks told one or two interesting stories of the estimation in which nurses were held by the British and native soldiers, and specially spoke of Matron A. Ward and Nursing Sister K. Nevill, both of the West African Frontier Force. These ladies, although they had completed over a year's service in West Africa, volunteered to serve with the Field Force. They rendered most valuable service in that trying climate, and by their

kindly care and devotion to duty alleviated much suffering. Of the seven Nursing Sisters employed with the Force, he specially recommended the two mentioned; and it was satisfactory to know that they have received the Royal Red Cross.

The Lady BALFOUR OF BURLIGH, the President of the Scottish Branch, then spoke a few words, but they were enough to show how deeply she had the interest of the Colonial Nursing Association at heart. She said she spoke under difficulties, as hitherto there had been no meeting of her branch, but she had contrived by judicious methods to collect some money, notably a cheque for £105 from Lord Strathcona. She thought all sorts and conditions of people should be interested in the Colonial Nursing Association—Colonial residents, ship-owners, merchants, &c. She alluded to the good work done by Mr. A. A. Gordon, the Hon. Secretary of the Scottish Branch, and concluded by expressing her opinion that it would be better to provide funds for saving the lives of the men than for collecting money for their widows.

Mr. WINSTON CHURCHILL said he had been asked specially to allude to a new departure of the Colonial Nursing Association, namely, the starting of a Sick Pay Fund to provide temporary financial assistance to any nurse who may become incapacitated during her connection with the Association. Though every precaution is taken before dispatching nurses, and each candidate is previously examined by Dr. Patrick Manson, experience has shown that a certain percentage of ill-health must be reckoned with, and the Committee wish to be in a position to afford help in cases of obvious need. The colony employing the nurse would be expected in such a case to contribute towards any relief it might be decided to grant, but the Home Association should, it is felt, be in a position to supplement it. Although sent out physically well there had been two cases of severe illness of nurses, one in Japan and one in the Malay Straits.

In order to raise the nucleus of such a fund, it had been arranged to hold a Ball in February. In consequence of the National mourning the Ball was postponed, but it is hoped to hold it later in the year.

As to the use and abuse of lady helps in South Africa, Mr. Churchill wished to say he differed entirely from those who said disagreeable things of ladies. The sick and wounded soldiers anyhow appreciated them. The famous surgeon who had passed such strictures on women had no doubt rendered valuable—but not entirely gratuitous—services. He begged to add that every one, no matter what his politics, could unhesitatingly help the Colonial Nursing Association in its splendid work by giving and giving liberally. In conclusion, Mr. Churchill supported the acceptance of the report.

Sir HUBERT JERNINGHAM, on rising, said that a glance at the report only was needed to show what progress had been made by their Association. His interest in the same was deep as he had been connected with it since its inception, and indeed had been present six years ago, 6,000 miles from here, when Mrs. Piggott in his presence developed the

scheme, which had since assumed such dimensions, to the Governor of Mauritius. He considered that good nurses in the Colonies were essential to our health, and consequently to our prosperity abroad. In conclusion, Sir Hubert said the sincere thanks of the Association were due both to Mr. and Mrs. Chamberlain, the latter for her untiring exertions in the cause, the former for the attention he, as Colonial Secretary, had brought to bear on this work of mercy, the supplying of cultured trained nurses for our Colonies.

The EARL OF WESTMEATH, the Vice-President, was the last to speak, and in a witty and telling speech he proposed a vote of thanks to Earl Grey, and begged all present to give a donation to the "recording angels" at the door.

In terminating the meeting, Earl Grey proposed a hearty vote of thanks to Lord and Lady Londonderry for placing their beautiful house at the disposal of the Colonial Nursing Association for their meeting.

NOTE ON THE RAPID CURE OF TROPICAL FEVERS BY THE ADMINISTRATION OF QUININE BY INTRA-VENOUS INJECTION.

By W. LEONARD BRADDON, F.R.C.S.

[Reprinted from Medical Archives of the Federated Malay States.]

In a valuable article on malarial fever, in Allbutt's "System of Medicine," Dr. Osler says, "The physician who at this day cannot treat malarial fevers successfully with quinine should abandon the practice of medicine."

The emphasis in this sentence is mine. So pronounced a dictum from so eminent a leader of medicine seems to form an indictment against even the low case-mortality for fever ruling in the Federated Malay States' Hospitals.

For instance, the deaths from malarial fever in the Negri Sembilan Hospitals during 1899 were under 2 per cent. of admissions (17 per thousand). It is true that Dr. Osler mentions that "of 616 cases [of malarial fever] which were under observation in the Johns Hopkins Hospital during the first five years of its work, there were only three instances of this [pernicious malarial] type, two of which terminated fatally."

The form of fever most prevalent in the tropics, however, is, according to Plehn, Koch and others, identical precisely with that which northern observers call pernicious or malignant tertian, the æstivo-autumnal fever of the Italians. Having no experience of these fevers elsewhere I content myself with calling the remittent fever, severe, malignant, and often fatal, with which we generally have to deal out here, "tropical fever." We are agreed, I think, it is usually of tertian period. The complexity of the infection renders the period usually

difficult to distinguish; parasites of every age being usually found swarming in the blood simultaneously. The morphology of the parasites, as I have observed them, agrees more closely with the æstivo-autumnal forms described than with any others, small ring- and seal-shaped forms being common. Pigment is so fine that the forms are often taken as hyaline. Another appearance, differing from any I have seen described or pictured, is that of a dotted irregular ramification or network of unequally chromatophil substance throughout the corpuscle; the appearance bearing close resemblance to a mycelial formation. For brevity I call such forms—the commonest with which I meet—"mycoid."

Death in such cases is brought about by the sudden onset, which there is usually clinically nothing to lead us to foresee, of what are called "pernicious attacks." In any case such an attack may occur, and it is clear, therefore, that so long as parasites remain in the blood there hangs over every patient a sword of Damocles.

According to all authorities the treatment of the pernicious as of the simple intermittent—here I again quote Dr. Osler—"is comprised in one word, *quinine*." How is that drug best and most effectually administered? We are all, unfortunately, acquainted with cases in which quinine given for prolonged periods, and in even heroic doses, fails. It fails to bring about complete disappearance of the parasites, within a period at which, if a perfect specific for all cases of malarial fever, it should destroy them. I am loath to utter a word to shake faith in quinine, which is undoubtedly the only, and a true and specific cure for malarial fever. But there occur such cases as I have mentioned where, as ordinarily administered, its usual good effect is not obtained. I do not lay the blame on the quinine. I believe it to be the mode of administration. Given *per os*, it is possible that chemical changes occur in the stomach which have the effect of altering its constitution; or again that organ may, in some cases, be incapable of, or resist its absorption in such a quantity as will be sufficient when finally delivered into the blood to antagonise the parasites. It may well be—and this seems to me very likely—that the cells lining the glands or lacteals or capillaries may be themselves so affected by the action of the drug so as to prevent the usual inward osmosis. An observation of my own, which I will detail later, shows that quinine is a powerful local anæsthetic. Upon the mode of action of the drug upon the parasites there is yet division of opinion; some holding that it kills the plasmodium by direct action in all its stages; others that it is most effective against the young newly liberated spores, and very young intra-corpuscular forms, the full-grown forms being unaffected by it; yet others that it is only upon the last-mentioned phase that it has action. Crescent and flagellated bodies are certainly unaffected by it. It follows that the *time* at which quinine is *best administered* is equally a matter of dispute. I know of no observations which show how long a given dose of quinine remains in the blood-stream. Nor, so far as I know, have any series of cases been published to show the results obtained

by administering the drug at particular stages of the disease.

Manson says of simple intermittents that "a fever-fit once begun cannot be cut short by quinine." and Osler states that administered some hours before a paroxysm it will not interrupt the cycle of development, but will, by destroying the products of segmentation, check the succeeding paroxysm. Given in a double tertian he says that it will not destroy the half-grown parasites in the blood which will cause the chill to-morrow but it will destroy those the development of which would have produced an attack on the succeeding—the third—day.

On the other hand, in dealing with severe remittents, especially in pernicious states, both Osler and Manson urge that quinine should be given *at once* by the most rapid method, in order to obtain effect as soon as possible. It would seem that, unless quinine has direct action on the maturer forms of the parasite, it must be quite futile to expect any *immediate* benefit from such a proceeding.

Bacelli, however (quoted by Celli), shows that entirely comatose cases may be rapidly benefited and revive, as a result of immediate and powerful dosage with quinine, introduced in solution into the veins.

My own experience lends apparent support to both the main views enunciated. In numerous cases, in which I have employed intravenous injection of quinine, in which there were parasites at all stages of growth, a complete disappearance of all parasites and clinical manifestations has followed the administration of a single dose. In other cases, where one dose only was given, the fever and the number of parasites due to have resulted from the generation which was mature when the dose was given, have disappeared, or become diminished, while the paroxysm, and the parasites of the following days, were unaffected. I am inclined to believe that quinine *directly destroys all forms of the parasite* (except the crescents) *actually circulating in the blood at the time at which it is given*. This is supported by the observation that, while the parasites introduced in a living film of blood into a solution of methylene blue ordinarily stain very slowly (ten to fifteen minutes), after the intravenous administration of quinine staining occurs almost instantaneously. In this view, if given in sufficient doses, it should destroy all the parasites in the system to which it can gain access. It is supposable, however, that the spores after liberation do not always immediately attack fresh corpuscles, and that as certainly sporulation takes place principally in the spleen and bone-marrow. It is in these, and perhaps other parts, that the intrusion of the spore into the erythrocyte takes place, under conditions which, it may be suggested, are practically extra-vascular, so that, while all circulating forms are destroyed by the quinine at their source of origin, the headquarters at which infection of the discs is carried on, they are in some way protected from its action.

It is to be conceived that, while the intra-corporeal cycle of growth of the tropical parasite occupies forty-eight hours, the exactness of recurrence of this

period clinically is due to some physiological periodicity of function affecting the organ in which, or the conditions under which the parasites effect occupation of the corpuscles.

For cases occur in which at the beginning of the attack very few parasites of any size are to be found, whereas an hour after they are extremely numerous and of all sizes; which seems to me to afford very strong support to the view expressed, the fact being explicable only on the assumptions either that the discs become infected only at a particular time, or that affected discs are secluded until the arrival of a time physiologically favourable for their circulation.

From this point of view the best time to administer quinine is not when the parasites exist in greatest number in the circulating blood, but before they have multiplied themselves by division; since there is no advantage in waiting to attack the spores, if the adult forms are equally unfavourably affected, or are destroyed by the medicine. This period would seem to be during the onset of the paroxysm, on the upward grade of temperature—clinically the shivering stage; which, in tropical fever, as seen here, generally occurs in the forenoon or at mid-day.

Whatever views or methods be adopted, the essential object remains the same: to destroy the parasites in the completest and most rapid manner possible. Following the instructions of Bacelli for intravenous injection of quinine, which he used it would appear only in comatose and other pernicious conditions, I became struck with the simplicity, surety and apparent innocuousness of the method.

The results, in some cases, are extremely striking and show that quinine will sometimes produce immediate and specific effects if admitted through the vein, when its continued administration by the mouth has proved unavailing.

On the other hand, in cases where death has not been averted by this method, the reason would seem to be that the drug has not been administered sufficiently early, or in sufficient doses; sometimes the malarial fever has been complicated with another form of remittent of which the cause has not been identified, and the pyrexial stage of which occurs, in opposition to ordinary malarial attacks, about 6 p.m., or later in the evening.

For instance, a Chinese was admitted, comatose, with a history of fever of fifteen days' duration. The blood examination revealed small unpigmented tropical parasites of three generations. He was emaciated, and an opium smoker; anæmic, constipated; temperature on admission, at 5 p.m., 103 degrees. Ten grains of hydrochlorate of quinine were given by the vein on the first day; and $\frac{1}{100}$ gr. strychnine ordered every hour. The second day the temperature, at 6 a.m., was 99.4 degrees, pulse 148, soft, feeble; respiration, oppressed and shallow, 56. There was no revival of consciousness. The temperature slowly rose to 102.4 degrees at 6 p.m. On the third day the temperature at 10 a.m. was 104 degrees, when another injection of 10 grs. was made, and cold sponging employed, which reduced the temperature to 103 degrees, when he became partially conscious,

and was able to drink; but after a further fall to 102 degrees, at 6 p.m., the fever rose again to 104 degrees at 10 o'clock, the pulse being 162, respirations 60. A further injection of quinine was given, and temperature was reduced a point, but the rapidity and feebleness of pulse and respiration increased rapidly, and he died at 10.30 p.m. In such a case the fatal issue may have been inevitable, but I am inclined to think that malaria was here complicated by another form of fever.

Case No. 2 was a Chinese admitted for fever, coming on every day, for ten days, *in the evening*. The fever began with a shivering fit. He was not an opium smoker, but looked old, and was very weak and emaciated. The blood showed a few small marginal tropical parasites. He was given 10 grs. of quinine by intramuscular injection on the second day of admission; and on the fourth day no parasites were found. The temperature chart showed a gradual rise throughout each day to about 102 degrees or less at 6 p.m. which ceased on the fourth day. From the fifth to the eleventh days there was no pyrexia, and there were no parasites. On that day he had headache and a paroxysm which began at 6 a.m. and reached crisis at 11 a.m. From six to ten very small unpigmented parasites were to be seen in every field. An intramuscular injection of 10 grs. of quinine was given at 11 and repeated at 2 p.m. and the temperature fell to 99 degrees at 6 p.m., in addition a mixture containing 10 grs. quinine was ordered to be given thrice daily. The following day showed slightly fewer parasites, five to eight in every field. An intravenous injection of 10 grs. of the hydrochlorate in 1 oz. of normal saline solution was given at 10 a.m., temperature being 101 degrees. When seen again at 12, the temperature was 103 degrees, the patient was collapsed, and entirely unconscious, with some delirium; there was "floccitatio," the head was drawn back and turned to one side, with conjugate ocular deviation; pulse weak and frequent, 78; respiration 25; and general muscular tremor. At 12.30, an injection of $\frac{1}{100}$ gr. strychnine, and ether were given, and ordered to be repeated every half hour. At 1, the temperature was 105 degrees; pulse feeble, 100; respiration 40; there was trismus. Cold sponging was employed, and 15 grs. of quinine dissolved in 30 ozs. hot sterilised $\frac{3}{4}$ per cent. salt solution injected into the vein. There was a short improvement of the pulse, which became stronger, and fell to 80; the trismus and rotation of head and conjugate deviation of eyes disappeared. This improvement was, however, only temporary and the patient died at 2.10 p.m. In this case, it may be supposed that the congestion of the brain on the second day of the second attack, which immediately caused death, was the result of the action of a brood of parasites which had not been affected by the quinine administered in the prior twenty-four hours. It is worthy of note also that this patient was taking in addition 10 grs. of quinine thrice daily *per orem* throughout the interval between his two attacks.

A third case, illustrating the uncertainty of prognosis in cases of tropical fever, is that of a Tamil admitted for irregular fever of fifteen days'

duration. Large pigmented parasites (one to every two or three fields) were found on day of admission at 8 a.m.; and an intravenous injection of 10 grs. of quinine given at 2 p.m. This dose was repeated by intramuscular injection at 8 a.m. and 6 p.m. on the second day; and *per venam* at 12 a.m. on the third day, after which all parasites disappeared. A mixture, containing the same dose, was given thrice on the fourth and fifth days. But the patient died on the latter at 4 p.m.

Cases illustrating the superiority of the intravenous over other methods of employing quinine may be quoted in great number:—

Case 1 was a Chinese admitted in a state of coma, having had fever for eighteen days. Pulse weak and irregular, 160; respirations shallow and laboured, 50; temperature 103 degrees; anæmic, constipated, tongue dry, *sordes*. At 6 p.m. an intravenous injection of 10 grs. of quinine was given in 2 ozs. n.s.s. The abatement of symptoms was rapid and the patient was able, the following morning, to speak and walk. Small unpigmented parasites were "plentiful." On the second day there was apyrexia. On the third day parasites were still numerous; 10 grs. of quinine was given by intramuscular injection at 6 p.m., and this was repeated on the fourth and fifth days. On the sixth the patient left the hospital recovered. On the fourth and fifth days there had been diarrhoea with offensive black stools. The temperature chart showed a gradual rise of temperature throughout each day till 6 p.m., so that it may be queried whether this case was one of uncomplicated malaria. But there could be little doubt that the quinine given at the beginning was of the greatest efficacy in restoring this patient from coma to consciousness.

No. 2 was a Chinese, brought in almost completely comatose, after fever of fifteen days' duration. Tropical parasites being found in the blood, an injection of quinine (10 grs.) was immediately given *per venam*. Consciousness partially returned the second day, so that he was able to hear and attempted to answer loud questions, though stools and urine were passed involuntarily under him. On the third day he was able to get up and walk. The blood having become free of parasites no more medicaments were given, and he was discharged after a week's further observation.

No. 3, a Tamil, admitted for severe fever; blood examination on the second day showing two to five parasites in every field, intravenous injection of 10 grs. of quinine was given at 8 a.m. on this day. No rise of temperature took place, but there was a sharp paroxysm on the third day; the same dose was then repeated; the parasites had entirely disappeared on the fourth day, and there was no return of them or other sign of fever during several days further during which the patient was kept in hospital. *Such a case illustrates the inefficacy of quinine administered on a given day to destroy or prevent the development of the parasites which will produce a paroxysm on the day next following. It follows from this consideration that it is desirable in every case of tropical fever to administer quinine—preferably per venam—on each of two successive*

days. This will usually be found sufficient for cure.

But examples of resistance even to this potent form of medication occur—*e.g.*, No. 4, a Chinese, admitted for fever of a week's duration—showed temperature, on first day of admission at 12 a.m., 103 degrees; pulse 112; respiration 40; tropical parasites of all sizes, the largest pigmented, eight to twelve to a field. The chart of the case shows that there were regular mid-day paroxysms of diminishing severity for six days, during which the parasites constantly fell steadily from the above numbers to nothing. Five grains of hydrochlorate of quinine were given *per venam* on the first and every succeeding day at 12 a.m. before the fever was cured. It is likely that in this case a dose of 10 or 15 grs. to start with might have secured the same result.

SHANGHAI—ANNUAL REPORT OF THE HEALTH DEPARTMENT, 1900.

DR. ARTHUR STANLEY, the Medical Officer of Health, Shanghai, in his annual report, gives an interesting account of the work of his department, of the vital statistics and of the diseases prevalent in the settlement. The growth of population of Shanghai in both the foreign and native communities is most striking and interesting. The foreign population has increased in number during the past five years from 4,684 to 6,774, and the native population from 241,000 to 345,000. The death-rate amongst the former per 1,000 per annum amounted to 14.32, and amongst the latter a death-rate of 11 per 1,000 is given. It must be remembered, however, that Shanghai is practically a foreign settlement to the Chinese, and that the majority of the Chinese population consists of young men who have their homes and their wives or families in the hinterland, and when illness overtakes the Chinese in Shanghai, they frequently leave the settlement and go to their native villages. This accounts in a large measure for the smaller death-rate amongst the native as compared with the foreign community.

FEMALE INFANTICIDE.

It is popularly supposed that the Chinese do away with the female infants at times, but the statistics given by Dr. Stanley help to refute the idea in a great measure. Of 992 children under 15 who were registered in 1900 as having died in the colony, 512 were boys and 480 girls, a fact which would seem to show that female infanticide does not prevail to any extent in Shanghai at all events.

THE PREVALENT DISEASES.

The enumeration of diseases met with in Shanghai is full of interest, inasmuch as it will be observed from the appended list that most of the diseases met with in temperate European climates prevail in Shanghai—a marked contrast to the diseases in the Hong Kong register, where such diseases as scarlet fever, diphtheria, measles, and even typhoid fever are altogether absent or much more rarely met with.

In this list, it will be observed, rheumatic fever finds no place, nor does leprosy or hydatids. Such tables as these are full of information for the study of that most interesting and instructive subject—the geographical distribution of disease.

INFECTIOUS DISEASES NOTIFIED AMONG THE FOREIGN COMMUNITY DURING 1900.

Small-pox	5	Malaria	460
Cholera	0	Lobar Pneumonia	49
Typhoid Fever	85	Infantile Diarrhoea	67
Typhus Fever	1	Chicken Pox	19
Dysentery	246	Dengue	5
Diphtheria	43	Erysipelas	1
Measles	26	Rötheln	2
Scarlet Fever	15	Mumps	108
Whooping Cough	31	Plague	1
Influenza	247		
Tuberculosis	52	Total	1,463

TYPHOID FEVER

is at least ten times more prevalent in Shanghai than it is in England, but the disease is of a milder or less fatal type.

TUBERCULOSIS.

Tuberculosis has caused fourteen deaths among the resident foreign population during 1900, a proportion of one death to every seven. This disease is also very prevalent amongst the Chinese population. Tuberculosis is common all over the world wherever the population is closely aggregated together. This close aggregation is probably the cause of its prevalence among the Chinese population, and its prevalence among the Chinese is the chief cause of its exceptional incidence among the foreign population. For this reason preventive measures are difficult of operation.

BACTERIOLOGICAL LABORATORY.

The official work connected with the control of the Department occupied so much time during the year that the desired attention could not be devoted to investigation. The subjects attacked, however, have included beri-beri, the etiology of local diarrhoeas, the preservation of the virus of rabies in glycerine, the variations of the incubation period of rabies, the intra-cerebral inoculation of rabies and the comparative bacteriology and chemical composition of waters of the Shanghai district including part of the Grand Canal.

Among prophylactic remedies the preparation of calf vaccine occupies the largest place. Mallein and tuberculin have been prepared. Haffkine's plague prophylactic has been prepared on a small scale, but stress of other work has rendered it impossible to prepare a large quantity, so that arrangements have been made for the transmission of a further quantity from the Bombay laboratory in case of need. The preparation of the cholera prophylactic has been rendered unnecessary on account of the prolonged immunity from cholera. Anti-typhoid inoculations are in abeyance awaiting more definite results of its success on a large scale in South Africa and elsewhere.

PASTEUR INSTITUTE.

The Shanghai Pasteur Institute after six months' preparation was opened to the public for treatment

in March, 1899, and the series has been continuously maintained, some 460 rabbits having been inoculated.

Up to the present date seventeen persons have received the treatment, including five for prophylactic purposes. In six instances the dog which caused the bite was proved to be rabid by inoculation in the laboratory.

The comparative fewness of cases receiving the Pasteur treatment in Shanghai is explained by the fact that the Chinese population do not as yet seek the treatment after rabid-dog bite. However, five Chinese, including four laboratory assistants, received the anti-rabic injections.

The further work done by the Health Department is reviewed under food, laundries, milk supply, meat supply, and last, but not least, the work done by the nurses connected with the Nursing Home.

Dr. Stanley seems to have the sanitation of Shanghai well in hand, and the municipality are to be congratulated upon the great advance made by them under the skilled direction of their able Medical Officer of Health. It is satisfactory to know that the British folk are taking serious note of sanitary work in their settlements and colonies in China, and that they are taking the lead in such matters instead of being set the example by the Governments of other countries, as is too often the case in our wide-spread empire.

HONG KONG—REPORT OF THE CIVIL MEDICAL OFFICER FOR THE YEAR 1900.

DR. J. BELL, Acting Principal Civil Medical Officer, in his report brings to notice a number of important facts in connection with the medical and surgical work of the Civil Hospital. As a record of the prevalent diseases met with amongst Europeans in Hong Kong the subjoined list is of interest.

General Diseases.			Europeans.		
German Measles	2
Plague	3
Influenza	45
Simple Fever, continued	7
Enteric Fever	21
Dysentery	40
Malarial Fever	160
Malarial Cachexia	2
Phagedoena	2
Scurvy	1
Alcoholism	55
Rheumatic Fever	7

It will be observed that measles (except German), scarlet fever, and mumps, have no place in the list, and that malarial fever is the most prevalent ailment. Seven cases of rheumatic fever are also reported, a fact in the record of disease which must be carefully noted, for rheumatic fever has heretofore played but an insignificant part in the category of disease in the Far East. It must be remembered, however, that the admissions to the Civil Hospital in Hong Kong largely, if not mainly, consist of the crews of ships and of persons passing through the port. Yet the recorded cases of rheumatic fever

amongst Europeans in the East have been so few that the climate was thought to be in some way responsible for the immunity attaching to this fever. It would appear doubtful after reading the above report whether immunity from rheumatic fever is really a fact.

SURGICAL OPERATIONS.

This list is interesting in many ways, and in none more so than in the very first of the diseases for which operations were necessary. The table is headed by the statement that fifty-six cases of bubo were either scraped or incised. The prevalence of buboes requiring such treatment has often been remarked upon, especially by Godding, Cantlie, Begg, and others, and the question comes to be what are the operations for which such treatment is necessary? They can but seldom be of venereal origin; operations for glands of such origin are rare in European hospitals, and the large number mentioned in the Hong Kong report is significant. They must be for the most part of non-venereal origin, if so what is the pathology of the ailment? Are they cases of so-called "pestis minor"? If so, the medical men in Hong Kong have an excellent opportunity of testing the relation such buboes have to plague; previous to the outbreak of plague in the Far East they were practically unknown.

DISEASES AMONGST THE CHINESE.

The Tung Wah Hospital is a native hospital managed by a Chinese committee, but used largely as a workhouse and as a refuge for the dying. Patients when coming to the hospital are offered treatment by either Western or Chinese methods, and during 1900, of the 2,981 admissions 57·7 per cent. were under Chinese native treatment; 32 per cent. were treated by Dr. Chung according to European methods, whilst 10·3 per cent. were transferred elsewhere.

TABLE I.—RETURN OF DISEASES AND DEATHS IN 1900, AT TUNG WAH HOSPITAL, HONG KONG.

Diseases.	Admissions during 1900.
GENERAL DISEASES—	
Small-pox	2
Measles	1
Mumps	1
Influenza	12
Diphtheria	1
Enteric Fever.. .. .	16
Cholera.. .. .	1
Dysentery	49
Plague	401
Malarial Fever—	
(a) Intermittent, Type undiagnosed	172
(b) Remittent	357
(c) Pernicious	12
Beri-beri	361
Erysipelas	5
Septicæmia	16
Tetanus	10
Tubercle	8
Leprosy, Tubercular	2
Syphilis, Secondary	53
Rheumatism	41
New Growth, Non-malignant	4
„ Malignant	8
Anæmia	31
Debility	48

Diseases.	Admissions during 1900.
LOCAL DISEASES—	
Diseases of Nervous System	99
Diseases of the Eye	11
„ „ Nose.. .. .	1
„ „ Circulatory System	63
„ „ Respiratory System	491
„ „ Digestive System	249
„ „ Lymphatic System	28
„ „ Urinary System	62
„ „ Male Organs	4
„ „ Female Organs	7
„ „ Organs of Locomotion	27
„ „ Cellular Tissue	85
„ „ Skin	80
Injuries, General	5
„ Local	156
Poisons	1
Total	2,981

In the Tung Wah Hospital the Chinese submitted to 131 surgical operations performed by Dr. Chung, including four lithotomies, one lithotrity, two cataracts, &c.

PNEUMONIC PLAGUE—RECOVERY UNDER TREATMENT WITH CARBOLIC ACID.

A Greek sailor was admitted to hospital on April 17, suffering from gonorrhœa. His temperature was 101 degrees, with furred tongue and a general apathetic condition, but this latter was thought to be owing to his being unable to speak English. His condition for the next two days was decidedly worse, though nothing definite could be made out. On the 20th Dr. Lawson saw the case and agreed that it was very suggestive of plague, and shortly after this he coughed up some typical bloody sputum which was found full of bacilli. His pulse and general condition being so bad it was thought better to isolate him in a private ward here instead of transferring him to Kennedy Town Hospital. Carbolic acid grs. 20 every three hours was at once started, with brandy, strychnia, &c., to counteract the cardiac depression. After a very few doses of this medicine his tongue, which was dry and brown, soon became moist, and the violent delirium passed into the quiet kind, when he was easily fed and kept from getting out of bed. On the 22nd he was decidedly better—tongue moist and cleaning, breath no longer offensive, and pulse good and no longer intermitting, sleeping well and no delirium. Sputum increased in quantity but no blood. Bacilli still present. Temperature 103 degrees. On the 24th his temperature fell to normal and he was practically well, though he looked very pale and pinched. Sputum had ceased entirely. Under tonics and full diet he rapidly convalesced, and left the hospital on the 30th.

This patient had roughly 280 grains of carbolic acid without any bad symptoms. One case proves nothing, but the high rate of mortality from this form of the disease, the serious condition of the patient and his rapid improvement, makes one feel that the drug had a good deal to do with the successful result.

RUPTURED SPLEEN—REMOVAL; RECOVERY.

A Chinese policeman, after being assaulted walked to the hospital, where the signs and symptoms were

those of internal hæmorrhage. The abdomen was quickly opened, blood clots removed, and the spleen ligatured and removed. The organ weighed 16 ounces, and was found ruptured right across from the anterior to the posterior border. The patient did well and left the hospital twenty-four days after the operation.

Current Literature.

MALARIA.

MALIGNANT MALARIA: APHASIA, RECOVERY.—A German engineer from a steamer trading between here and Haiphong was admitted on December 24. He was in a curious dazed condition, unable to speak distinctly, and could give no clear account of his illness. Temperature 99 degrees, tongue furred, but no vomiting, and apparently no pain anywhere. Heart and lungs were normal, but pulse slow and very feeble. Pupils normal and no facial paralysis. The splenic dulness was increased, liver normal, but skin and conjunctiva yellowish. A blood slide taken on admission was a perfect picture and showed in the same field numerous crescents, ring-formed pigmented parasites, pigmented leucocytes, and leucocytes containing one, two and even three red corpuscles and parasites. The urine contained a slight trace of albumin, probably due to a stricture which necessitated the urine being drawn off by a No. 4 catheter on the 26th. Under quinine, both hypodermically and by the mouth, stimulants and free purging, the patient slowly improved, and the temperature, which rose daily to 101 and 103 degrees, dropped to normal without any further rise. The speech, however, continued thick and indistinct for some time, and he told us "he couldn't remember the eight words." This latter condition, which distressed the patient very much, gradually improved under small doses of iodide of potassium and arsenic, though there was an occasional hesitancy for a word now and then. The blood slide taken on January 2 (forty-eight hours after the temperature fell to normal) was quite free from malaria. Patient was discharged quite well on January 21.—Dr. Bell, *Hong Kong Civil Hospital Report*, 1901.

MALARIA TREATED BY HYPODERMIC INJECTIONS.—

R	Quininæ hydrochloro-sulphat	2.50 gm.
	Aq. distil.	10. gm.
M.	S. Inject 1 to 2 c.c.		

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MALARIA IN CHILDREN.—In the *Brooklyn Medical Journal*, April, 1901, Dr. W. A. Northridge contributes an article on pediatric malaria. This subject has been so seldom dealt with, in fact it has been so systematically neglected, that the article is a very welcome addition to the literature, and to our knowledge of malaria.

Diagnosis.—Malaria is so different in its manifestations in children under the age of 5 years, that if one were to depend on the recognition of the ordinary symptoms of malaria as found in the adult, the existence of the disease in certain cases would often remain undiscovered. While the hematozoon does not spare any organ or tissue of the body in the child the nervous system is by far most often and most profoundly affected. This is probably due to the susceptibility to disease of this system in the young. If fever occurs in a child, we must suspect the plasmodium malarie, and take it into account in making our diagnosis. If the patient's fever is periodical, and if the spleen is found to be enlarged the diagnosis is easy. The four most important symptoms of malaria in the child are fever, periodicity, anæmia, and enlarged spleen. The enlargement of the spleen is not an essential factor in the diagnosis, for not only may its size vary but in early stages the increase in size cannot be made out. In chronic cases, however, the spleen is invariably big and at times of great dimensions.

The infantile type of malarial fever is usually the quotidian, whereas in adults the tertian prevails. In children also it is seldom that any other than the hot stage of the attack is recognisable; chill is generally absent or may be unrecognised; convulsions and involuntary muscular contractions are seen at times. The child is usually drowsy, listless, and yawns frequently, with nausea and vomiting, in about two-thirds of the cases. The temperature is apt to range high, 104 to 108 degrees F., during the febrile attack. Of other features of the disease it is noted that sweating is seldom noticed; periodicity is pronounced; anæmia marked; spleen enlarged; the nervous system is often profoundly affected; a jaundiced appearance is occasionally seen.

Infection.—When children suffer from malaria the nurse or mother will usually be found to harbour the malarial parasite. Usually the tertian parasite will be found in both, but Dr. Northridge relates one case where the mother had tertian and the child had a parasite of a quartan type. The explanation to be offered is probably that the child was infected not from the mother at all but from some other member of the family, or by a neighbour with quartan ague and great anæmia. Often the diagnosis must be made on the periodical return of a high fever, with or without the presence of an enlarged spleen, all other symptoms being absent. Any combination of symptoms with fever may be found, with any other symptom absent or present. For instance, a child may vomit, and this may be followed by high fever, and in a few hours he may apparently be perfectly well again, and playing about. This will be repeated day after day, until the doctor is summoned, and what appeared an attack of indigestion alone will be proven by its

recurrent fever, its periodicity, and its cure under quinine, to be malarial infection.

Of peculiar types of symptoms Dr. Northridge relates many. A few examples will prove of interest:—(1) A boy, aged 3 years, with a temperature 104 degrees F.; indulged in loud screaming, and at intervals he took the position of opisthotonos. (2) A boy, aged 2½ years, had marked paresis in the right arm occurring after the fever commenced. (3) A boy, aged 2½ years, had had attacks of malaria ever since he was 12 months; when first seen by the doctor he was in the midst of an attack of tertian type, and had considerable loss of power in the muscles of the legs with difficulty in walking. (4) A boy, aged 4 years, had fever which recurred every day, with dragging of the right leg with partial paralysis. (5) Girl, aged 1½ years; the fever was accompanied by twitching and a partial motor paralysis of the left arm and leg.

Amongst other signs and symptoms noted in malarial children are:—(6) Paralysis of the tongue. (7) Partial loss of motion in both lower extremities. (8) Partial motor paralysis of right leg. (9) Malarial bronchitis with slight paralysis of motion in left leg. (10) Syncope in three cases, the attack in each case taking the place of a chill, the fever coming on afterwards. (11) Malarial torticollis and (12) malarial chorea are neither of them rare. (13) Headache. (14) Recurrent diarrhoea accompanied by nausea. (15) Pneumonia is simulated very closely.

The diagnosis that the above signs and symptoms were of malarial origin was based upon the periodicity of the recurrences and upon the fact that quinine effected relief. Quinine is the specific remedy, arsenic stands next, and children bear both drugs well. Powdered cinchona bark mixed with powdered liquorice root is a convenient and efficient method of giving the antiperiodic.

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Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletín de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology
British Medical Journal.
Brooklyn Medical Journal.
Climate.
Clinical Journal.

Clinical Review.
Giornale Medico del R. Esercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
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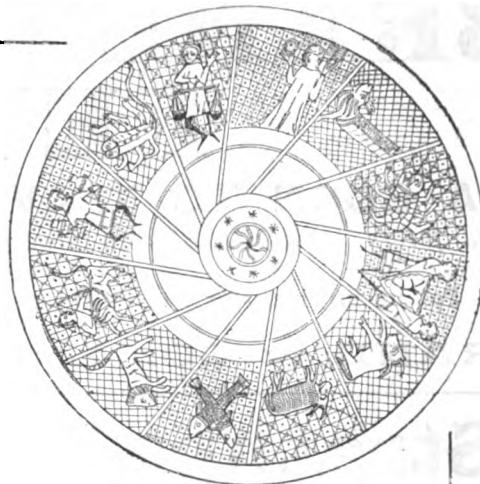
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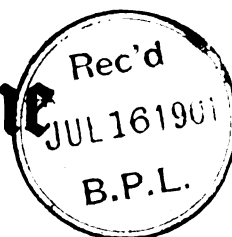
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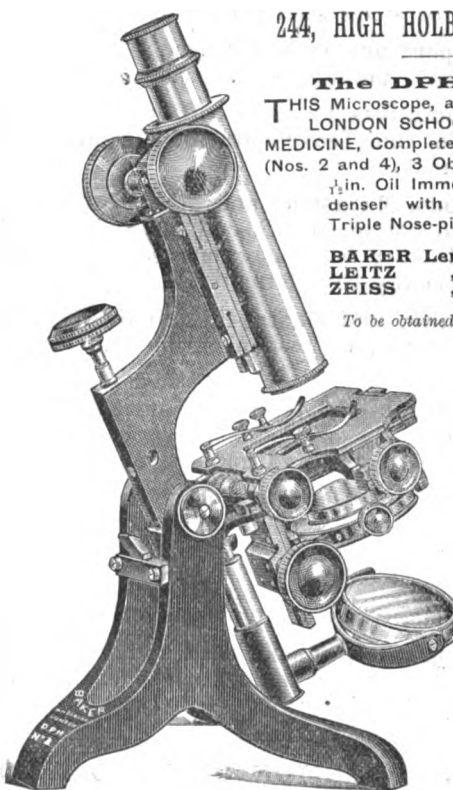
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Original Communications.

FILARIASIS IN BRITISH CENTRAL AFRICA.

By C. W. DANIELS, M.B.

THE *Filaria nocturna* is found in many parts of British Central Africa, but its distribution is not uniform.

Specimens of the blood of 687 natives were examined at night and this filarial embryo was found in 35 of them, or 5 per cent.

For convenience I divide the districts from which the natives came as follows:—

District.	No. Examined.	
Highlands (Shire and Angoni)	137	.. No filaria.
The Upper Shire River	120	.. Filaria in 1, or .8 %.
The Lower Shire River	52	.. Filaria in 13, or 25 %.
The Zambesi and Chinde Rivers	100	.. Filaria in 14, or 14 %.
Lake Nyassa (Southern half)	38	.. No filaria.
Lake Nyassa (Northern half)	163	.. Filaria in 8, or 4.9 %.
Other districts	77	.. No filaria.

Of those from other districts only two, Likoma (22) and New Heligoland (19), were in sufficient numbers for negative results to be of any value. Both these places are islands in the middle of Lake Nyassa.

The distribution of elephantiasis corresponds with that of filaria. In neither the Shire nor Angoni Highlands, in the Upper Shire, the south end of the Lake, nor in Likoma have I been able to hear of any cases, though there have been abundant opportunities for such cases to have been seen if they were present.

On the other hand it is well known to be present in the Lower Shire, the Zambesi, and at the north end of the Lake, and I have seen cases myself in each of these districts.

It has long been known that the further develop-ment of these filarial embryos can take place in several species of mosquitoes, and that in conse-

quence these insects are probably required for the propagation of filariasis.

One mosquito was particularly noted as being common on the Zambesi and Lower Shire Rivers, and also at the north end of the Lake, and its absence from the Shire and Angoni Highlands and great rarity on the Upper Shire River, had also been observed. As this distribution was the same as that of filariasis it seemed probable that this mosquito,* a large yellow *Culex* with banded legs and very scaly wings, was the main carrier of this parasite.

On feeding these mosquitoes on a patient with abundant filaria, the anticipation was fully con-firmed, as with hardly an exception the mosquitoes so fed contained the filaria in the thoracic muscles. They developed, as described by Bancroft, up to the sixth or seventh day, but after that I had to remove them to the Highlands, and there, after twenty-one days, development was still incomplete, probably on account of the lower temperature.

Experiments were made in the same manner with other mosquitoes, and only one, a *Culex* browner in colour than the other, and found in the Lower Shire and Zambesi, was found to carry them.

The other *Culices* tried, viz., the two commoner ones in the Highlands; that common on the Upper Shire and a small *Culex* common in the Lower Shire and Zambesi and found also in the warmer parts of the Highlands, gave negative results, as also did *Anopheles funestus*, so widely distributed throughout the country.

Other mosquitoes were tried, but the number examined was too small for much value to be attached to the negative results obtained.

In spite of the general correspondence between the distribution of elephantiasis, filariasis, and a mosquito in which the filaria can develop, the relationship does not appear to be simple.

Without a detailed study, including the influence of water supply, I do not think the theory of the

* *Panopiles Africanus*, Theobald.

necessity of some other factor can be disregarded, though possibly the explanation may be that in some countries the filaria-bearing mosquito is a tank or barrel breeder, and in others, as in British Central Africa, is not.

Filaria perstans was found in one case only. This patient was a native of Mwenutambo, in British South Africa territory. The village is situated amongst the sources of the streams running into Lake Bangweolo, and consequently is on the sources of the Congo.

It is, however, near the water-shed between the Congo and Zambesi, as well as of the rivers running into Lakes Tanganika and Nyassa. The man had travelled a good deal about the south end of Tanganika and on the plateau, but had never been down the Congo.

I found no *Filaria perstans* in forty other persons from this district, nor in thirty from the eastern shores of Bangweolo, nor in any of the 687 from other parts of the country.

I have been unable to get any account of any disease resembling "sleeping sickness" in that district, but Dr. Mackay informs me that the natives on the south-west arm of Lake Tanganika seem to be aware of its existence.

ON THE ABSENCE OF CERTAIN DISEASES FROM THE CHANGPOO VALLEY AND ITS ENVIRONS, FOKIEN PROVINCE, CHINA.

By J. PRESTON MAXWELL, M.B., B.S., F.R.C.S.

It is always a matter of extreme interest and importance to note the absence, as well as the presence of disease in a locality; and as the absence of certain diseases in this valley throws a light on some of the more important questions in their pathology, I have ventured briefly to enter into these questions.

The Changpoo Valley is situated in the south of the province of Fokien. Lying about 50 miles south-west of Amoy, it is shut off from the sea by an irregular and broken range of mountains rising to a height of some 2,000 to 2,500 feet.

The valley itself is about 25 miles long by 10 miles wide, and has several arms which run off among the mountains. Leaving the valley, except where the river which drains it makes its way into the sea through one of the aforementioned gaps, one has to cross mountain passes of some altitude. The valley itself is about 300 feet above sea-level, and about 15 miles from the actual sea line, which is here broken by large sandy bays alternating with rocky headlands.

It is almost entirely devoted to rice culture, other cultivated land being planted with sweet potato, the poppy (for opium), barley, peas, and other vegetables, as leek, garlic, &c. The city is some 800 years old, and is half in ruins, but still has a population of some 20,000 inhabitants, while the country round is studded with large villages. It is difficult to estimate the total population, but the whole region is estimated by the Chinese to contain about one million, and as I have not only got the

Changpoo Hospital records for the past ten years, but have travelled all over the region seeing patients, both those who had come to see me, and in the more serious cases going to see them in their homes, and have seen myself some 30,000 or more individual patients, I may claim to have had a fair amount of experience from which to judge.

I.—SPECIFIC INFECTIOUS DISEASES.

Both *scarlet fever* and *diphtheria* are entirely absent. Acute tonsillitis is rare, and diphtheria has never been seen either by my colleague, who has had ten years' experience, or myself. As a direct consequence scarlatinal nephritis and diphtheritic paralysis are absent. Diphtheria undoubtedly exists at Amoy, which is our coast port, but there it has almost certainly been imported from outside.

Measles, *chicken-pox*, *smallpox*, *German measles*, and *whooping-cough* are all met with, but owing perhaps to the warmth of the climate, whooping-cough is a mild, and compared with the disease as seen in England, an insignificant affection. The symptoms of the disease are the classical ones, but complications such as broncho-pneumonia are extremely rare. Measles in like manner is a much less serious disease than in England. Varicella gangrenosa I have met with once. Smallpox is here a disease of childhood, and we have just passed through a serious epidemic which has had a considerable mortality.

Epidemic influenza exists and runs much the same course as at home, and is also attended by its common complication, pneumonia; the mortality, however, is less than at home. *Typhus fever* exists as a rare disease, and I have seen one well marked case which died. It has not been epidemic here for the last ten years, but of course at any time may become so.

Typhoid fever is endemic, and I hope to be able soon to write a further account of its occurrence amongst natives. When looked for, it does not, in my experience, present the great difficulties in the matter of diagnosis, which have been attributed to it by some writers.

Mumps exists and runs the same course as at home. It is in no wise a serious disease here, and I have not met with a case complicated with orchitis.

Relapsing fever I have not seen, nor has a definite case been as yet diagnosed at the hospital.

Erysipelas runs the same course as at home, and with the same care as is taken at home rarely occurs in hospital. During my time, no case has occurred in a surgical or other patient, although from time to time I have taken in cases from outside for treatment within the hospital.

Anthrax and *glanders* have not as yet been met with in the hospital practice, and as there is not much dealing with hides and there are very few horses in the region, it may be long before we meet with a case.

II.—SPECIFIC DISEASES NOT GENERALLY INCLUDED UNDER HEAD NO. I.

Tuberculosis is rampant in this region. Both lung, pleural, joint and glandular affections are common. Tubercular meningitis, however, appears to be very rare, and I have not met with a case yet.

On the whole it may be termed a chronic, rather than an acute affection, and the lung cases as a rule drift on for years, many of them reaching a good age.

Syphilis is also terribly common, and all the stages are frequently met with; also occasionally the neglected cases of what one might almost call malignant syphilis, deep excavations of the cranial bones and ulceration into joints occasionally presenting themselves for treatment. In spite of this, *aneurism* is almost unknown. One doubtful case of abdominal aneurism is found in the records of the hospital. I have never met with a case, and seeing that the people are accustomed to lifting heavy weights, and to severe exercise, such as carrying burdens and sedan chairs and the like, it is the more surprising.

Rheumatic fever is entirely unknown. I have not met with or heard of a case in this region, and in support of my statement, I can adduce the fact that chronic endocarditis is also practically absent.

Excluding cases of *anæmia* and the like, which present hæmic murmurs, I have met with the following cases of *heart disease*:—

- (a) Three cases of congenital heart disease.
- (b) Two cases of senile atheroma with aortic incompetence.
- (c) Two cases of mitral regurgitation in patients who were malarial wrecks. In both there was dilatation of the heart, and I regard this as being the cause of the regurgitation.
- (d) One case in which I was unable to make up my own mind as to the location of the murmur and its cause. At the time I saw her the heart was beginning to fail.

(e) I have also seen acute septic endocarditis in three cases of acute septicæmia, all uterine in origin.

Does not this make the microbic origin of rheumatic fever very probable? In some of the coast ports it is present, and there endocarditis of the usual kind is also present.

Bearing out in a wonderful way the current views on *chorea*, this disease also is entirely absent. *Osteoarthritis* is also a rare disease, although it does occasionally turn up, and I have seen a few cases of affected joints, but all only to a slight extent. *Charcot's disease*, in spite of the amount of syphilis about, I have never seen, and there is no case recorded as having been met with at the hospital.

Malarial rheumatism is often met with. This place is a notably bad malarial region, enlarged spleens and malarial wrecks being common, and joined to this is a large amount of the so-called malarial rheumatism. It is a myalgia and bone pain which is definitely cured and often speedily, with quinine, and that it has nothing to do with acute rheumatism is sufficiently proved by the absence of the latter.

III.—GENERAL DISEASES.

Amongst this class there are two notable diseases which are fairly common at home and absent, or practically so, in this region. The one is *chronic granular kidney* and the other *rickets*. The absence of the first is to my mind accounted for by the absence of alcohol, lead and gout. Drunkenness is

almost unknown here owing to the absence of spirits and beer. The Chinese have a native spirit, but it is mild, nasty stuff, and is not consumed in any great quantity. As to lead, I have never seen a case of poisoning here, and there is so little metal work done that that is not wonderful, and as to gout, I have seen one doubtful case. The consequence is that the large hypertrophied hearts not infrequent in England are not met with here, and, as I have pointed out before, aneurism, and I might almost say arterial degeneration, is rare, barring the senile form.

As to rickets: the staple food of the people is rice rendered palatable by the addition of small bits of meat, fish, &c. Most of the babies are breast-fed, and sometimes continue to take the breast for three and even four years. But at the same time, from their earliest days, they have all sorts of food thrust into them, such as sugar, rice cakes, tea, &c. They live amongst filth and get along often as best they can. On the whole they are a great deal out of doors, and that may account for their pulling through this treatment, and one must remember that a great many of the puny ones die. But why is rickets absent? I have only seen one case and that not a severe one. Perhaps it may depend on their open air life and the amount of human milk they get. They are certainly not kept off their feet, and in other words are not coddled. If the mother has no milk to give, she will often beg some from other mothers, and as China swarms with babies and mothers, this is not difficult. I have known of one baby sucking from six different mothers' breasts in the course of a single day.

These few details with regard to some of the commoner diseases met with in England may prove interesting to those who are engaged in investigating the causation of such diseases as rheumatism, rickets, and the like.

NOTES ON A CASE OF AMOK.

By JOHN D. GIMLETTE, M.R.C.S.Eng., L.R.C.P.Lond.
Acting Residency Surgeon, Pahang, Malay Peninsula.

THE following incident, which is known in English as "running amuck," is a fairly common occurrence among Malays.

Man, a Mohammedan, aged about 23 years, male, a native of Kedah, single, was formerly in the Perak Police Force, but left the service when his time expired and came to Pahang, where he obtained work as a carter at Sempam.

About the end of last June, Mr. Rance, his master, noticed that he was odd in his manner; he lolled about the house in a way unusual to him, and one day apparently had a delusion about seeing a monkey on a tree. He asked that it might be shot, and expressed himself as being queer in the head. In a letter dated October 2, Mr. Rance says: "His conduct was a little strange, but I put it down to his not agreeing with the other boys." For a few days he had been acting as a servant, but could not get on well with the others, who were all Chinese. He asked to leave on this account and was discharged.

Mr. Rance had known him for more than two years, and says: "When I heard of the amok I would not believe it, and was much astonished when it turned out to be true."

Man came into Tras, a place near Sempam, where he spent two nights in the jungle, eating little or nothing, and apparently wandering about alone; his legs were scratched with thorns, and he gave this in explanation on being questioned afterwards.

He was not a ne'er-do-well, an opium smoker, nor a foolish extravagant Malay. He had no debts, no quarrel or love affair, but was evidently "sakit hati" with the Chinese. The words "sakit hati," which form a phrase in common use among Malays, are defined in Marsden's "Dictionary of the Malay Language" as resentment, malice, bearing a grudge—heart (morally) ati.

"Ati," however, is sometimes referred to as meaning the liver, but as the seat of affections it corresponds with the word heart. The expression is, perhaps, better defined in an older dictionary (Howison's "Malay Dictionary," 1801) as: spite, envy, offence, vexation, an affront, sorry for, offended.

On July 6, 1900, Man came out of the jungle and went into a house at Tras where his native chief, Ismail, was staying. The house was empty at the time except for a Malay who was asleep. He took Ismail's sword from under his mat, went out by the back door and walked towards a Chinese shop in the village close by. Five Chinese and a Javanese coolie were sleeping and smoking opium in different rooms. It was mid-day, the men were strangers to Man. He slashed at the first two Chinese who were lying down and killed one, nearly striking his head off with the sword; he gave the other a severe wound on the face, which has since proved fatal.

Without uttering a cry he then diverged into a smaller room where two other Chinamen were lying down. He cut at one and brought him to his knees, killing him at once by a deep wound in the neck; the other man endeavoured to escape, but he wounded him on the arm and pursued him out of the door. The Javanese now seized him from behind and managed to drag the blade of the sword out of the hilt. It was loose. They struggled, Man fought and bit, crying out "I want to run amok." He finally "slipped away like a fish," to use a Javanese expression, and escaped almost naked into the village, where he armed himself with a large piece of timber. Several Sikh policemen forcibly arrested him, but he struggled so violently that he nearly broke away. At the inquest held the next day he could not be made to give any statement at all, but uttered a long continuous sort of whine. During the night he had done nothing but stamp and howl; the whole of Tras could hear him.

Two days later, the Assistant Commissioner of Police examined him in his cell. He talked in a friendly way, said he could not recollect the time spent in the jungle, and could remember nothing about the murders. He remarked that there were a few more "orang kapir" (non-Mohammedans) out of the world, and concluded that he must have killed them because he was charged with their murder by the Police. He ate rice, bathed and joked during

the afternoon (July 8), but at midnight began to shout as if terrified, and was found crouching in the corner of his cell. He said it was full of people who wanted to kill him; he thought he saw them and begged to be taken out and tied up, if necessary, to a tree in the jungle. He quieted down and was brought into the Kuala Lipis Gaol.

Since admission, on July 13, he has been in a solitary cell, quiet, sulky and reserved, but quite coherent and apparently rational, except that his memory of the murders seems to have been completely wiped out.

Man was certified as not insane by the surgeon in charge.

At that time he had been under observation for less than a month, and no complete history of the case was at hand. A good deal of the previous history has been gathered since from various sources.

Man is a well-developed Malay, apparently in good physical health. The knee-jerks are exaggerated; there is no history of syphilis. The urine is of low specific gravity—1006—does not contain sugar or albumen; the average quantity passed in twenty-four hours is forty-six ounces. Vision is normal, but the pupils are equally dilated. His eyes are restless, the look being uneasy and the glance unsteady. I am not able to record any physical signs of insanity. There is no aural or nasal disease; the facial expression shows mobility. He persistently denies all memory of the amok, and has repudiated the acts which he has committed, so often, that I consider that he had no motive for the crime, and that this obliteration of memory is a genuine symptom of some phase of mental disease.

On one particular occasion (September 8), at the end of a conversation, his eyes assumed a wild stare, and I believe he was about to spring at me. The European gaoler and a Tamil dresser who were present said that this was the first time that they had noticed any change of demeanour. His expression was that of an insane person; the eyes glared and were widely open.

In the Indian Penal Code (Mayne), in a commentary on Section 334—"Voluntarily causing hurt on provocation"—the words "to run amuck generally like a Malay" are used, and this is, I believe, the only special reference to amok in any Code. The commentary is as follows:—

"The meaning of this (Section 334, voluntarily causing hurt on provocation) and the following Section (causing grievous hurt on provocation), of course is, that if a person who has received provocation assails the person who has given the provocation, he is only liable to a light punishment. But if, while out of temper in consequence of the provocation he were to attack an innocent person, or to run amuck generally like a Malay, the previous provocation would be no excuse."

The idea that a Malay who runs amuck may be insane does not seem to have occurred to the commentator.

In the case of Man, three innocent people have been slain, others have been grievously hurt without giving any provocation, and he is liable by law to be hanged. It is well known that this sentence has been often carried out and with advantage in amok

trials. In "Hakayit Abdulla" (Henry King & Co., London, 1894) it is recorded that on the death of Colonel Farquhar through an amok in Singapore many years ago, the sentence on the murderer by his own countrymen was that he should be punished by the execution of himself and his wives and children. The translator of the book comments on the severity of Malay laws on such occasions. He remarks, however, that, although they may be obnoxious to our moral code, yet they are the most applicable to the genius of the people, and form notoriously the safety-guards to native rulers, who have never been known to be assassinated.

I need only further refer to the almost classical instance in Penang in 1846, when the Chief Justice (Sir William Norris) passed the death sentence after the most severe summing-up, which, perhaps, has ever been uttered in an English Court of Law. The effect of this sentence seems to have checked the occurrence of amok for a time in Penang.

Similar cases have been tried and sentenced of late years both in the Straits Settlements and in the Federated Malay States. In the *Singapore Free Press*, of September 13, 1900, the trial of Hadji Alli, who ran amok in Minto Road last May, is reported. In defence the plea of insanity was set up, but it was not accepted, and the accused was sentenced to death. The trial of Hadji Sukor was held the next day for a similar offence, and, it is said, medical evidence on the state of the prisoner's mind was to the effect that nothing abnormal was noticed.

On the other hand, there are always Malays who, having managed to evade violent deaths, at the time of their amok, from the hands of their comrades, have been subsequently acquitted on the plea of insanity.

Three such cases are quoted by Dr. Ellis (*Journal of Straits Medical Association*, August 21, 1897), who also gives a complete account of the Penang murders, referred to above, in his article on "The Amok of the Malays," in the *Journal of the Straits Medical Association*, No. 4, Singapore, 1894.

The mere fact of a Malay having committed amok raises no presumption as to his sanity or insanity. He has simply run amok. The Malays themselves in Pahang do not regard the occurrence as an exhibition of true insanity, being more inclined to ascribe it to spiritual agency, and I think the general tendency throughout the East is to regard it as a vice or crime rather than a disease.

Amok when scientifically considered seems to be a symptom which is subject to much individual variation. In most cases the individual appears to be rendered subconscious, as in somnambulism, by the unrestrained action of his own automatic centres. In some cases, but not in all, this appears to be due to a special pathological condition—a psychical condition, for want of a better word.

This psychical condition seems to result, as it were, from some reflex nervous disturbance or from an auto-intoxication, and to be due to an irresistible impu'se of a purposive character.

It is characterised by: (1) A sudden paroxysmal homicide in the male, with evident loss of self-control. (2) A prodromal period of mental depression. (3) A fixed idea to persist in reckless

homicide without any motive. (4) A subsequent loss of memory for the acts committed at the time.

There is constant grouping of these four cardinal symptoms in many of the cases of amok in which notes have been made. Unfortunately the references are very few in number.

They are cases of the true insanity of amok, and I think the history of Man may be taken as a typical example of a case of this kind of insanity.

In other instances, there may be no subsequent loss of memory, or there may be a doubt about it, and there is some motive for the amok. For the sake of convenience in description these cases may be referred to as instances of "false amok." It is undesirable, however, to regard amok as being, in any way, a specific disease. As an example of this "false amok" I may quote the case of a perfectly sane Malay who was under my care in Pahang a few years ago. On account of the infidelity of his wife he not only attempted to murder the friend who betrayed him but at the same time ran amok generally and succeeded in wounding several other people who had in no way offended him. Both varieties are popularly so-called cases of amok; it is very necessary therefore in making a diagnosis to recognise any definite clinical features, in order to differentiate, if possible, between sanity and insanity. Malays who are quite sane, although perhaps subconscious, during the height of the attack, may be led to commit amok from motives of jealousy or revenge, or from some definite reason such as wounded vanity or a dread of death on the scaffold. A case has recently been reported from British North Borneo in which a Malay convict ran amok on the eve of his execution.

By no means do I go so far as to say that because a person has run amok that he should be exonerated from all criminality. But if he has the four definite symptoms mentioned above and has committed the act of amok without any possible motive, without profit to himself or any other person, without premeditation and consequently in a manner quite different from that in which murder is generally committed, it seems almost a certainty, at least in the case of a civilised person, that it is due to the mental disturbance of some form of insanity.

In the case of a European there would be but little doubt, but in the case of Malays who are so peculiarly apt, as a race, to run amok, the greatest caution is necessary when expressing an opinion. Even the special knowledge of a skilled alienist may be required.

The difficulty of obtaining any family history from a Malay who has run amok, or practically from any native, adds to the danger of making a wrong diagnosis, and in this, as in other questions of criminality, any open declaration of theory may put an unsupported witness in a false position in a Court of Law. It comes to be a matter of the highest importance, therefore, that every so-called case of amok should be kept under medical observation for a definite period before trial, so that the mental aspect of each case may be decided on its merits, and the opinion of more than one medical practitioner may be heard.

Amok (a Malay word in actual use pronounced

amok) is thus defined in Marsden's "Dictionary of the Malay Language": "Amok—engaging furiously in battle, attacking with desperate resolution; rushing in a state of frenzy to the commission of indiscriminate murder; running amuck." It is applied to any animal in a state of vicious rage, and it is interesting to note that the Malay word *niamok*, mosquito, is derived from it.

The primary idea in the Malay mind is, I believe, that it is a state of violent delirium which should ensue when a brave man's blood is up in the excitement of battle. In Malay tales it is fitting for the hero to lead the attack recklessly, shouting "Amok! amok!" and taking no count of his foes.

It may be that the stimulus is still a memory image of the ancient battle cry coupled with the proud idea of dying sword in hand, but the kind of amok which now disturbs the public tranquility from time to time, in the days of quiet prosperity, has nothing to do with the actual reality of honourable warfare.

By "running amuck," as I understand the expression, is meant a more or less sudden outbreak which is characterised by an unprovoked attack on any one who may happen to be in the way. Defenceless women and children are frequently attacked.

The intent to kill is imperative, and it is worthy of remark that even the weapon used is chosen with the idea of attaining this object without fail. A stabbing or cutting weapon is invariably used in preference to a club or fire-arm, though of course this may be due to the fact that they are the national weapons and most likely to be at hand.

No case has come to my notice of an amok attack by a female or by a relative of one who has run amuck. It has been said, but I do not know on what authority, that the tendency is a very infectious one, especially among the relatives of those who have perpetrated the act.

Amok seems to be unknown among the Sakei or aboriginal inhabitants of Malaya.

The attack might be induced under the special circumstances of strong suggestion in a Malay native, either male or female. That it should otherwise be almost universally confined to the male sex is a point of some psychological interest.

Some observers are of opinion that amok is merely an exhibition of bad temper; others that it is a kind of suicide on the part of a desperate Malay. For example, it has been supposed that the sane Mohammedan, not daring to take his own life in accordance with the Koran, hopes to attain his object by being destroyed in the frenzy of an amok. And, indeed, many men have been summarily despatched for running amok by their fellow Malays. I think the inference is unjustifiable because the natural prejudice against suicide is almost universal amongst Malays. Ordinary suicide is very rare among the males, although it is not unknown. In 1898 there was a case in Pahang in which a Malay quietly cut his throat in a boat on the Jelai river. He was ill and was supposed to be insane. Another Malay was under my care with a cut throat in Kuala Lipis in 1898. He was obviously insane, and subsequently died in the Selangor Asylum.

Another case occurred in the Jelai district in 1895, in which a Malay girl, on the eve of her marriage, cut her own throat with a razor belonging to her father.

The history is pathetic and has formed material for a novel. Before her death she was asked her reason for having cut her throat, and she replied that, whilst combing her hair in front of the looking glass, the ugliness of her own features was more than she could bear, so she desired to commit suicide, being too ugly to live. The only case of suicide which seems to bear upon amok is one which occurred fifteen years ago in Perak, when a Malay ran amok, and after wounding several people drew his weapon across his own throat and so died, in order, apparently, to prevent himself being captured alive. It is logically incorrect, however, to conclude that a naturally indolent Malay will go to the exertion of a preliminary amok merely with the idea of bringing about his own destruction.

The well-known association of suicidal mania with religious melancholia seems to have led other observers to conclude that the influence of the Mohammedan religion may be a factor in the causation. But although amok has made the Malays and their descendants notorious all over the world, it does not appear to have affected the millions of Mussulmans in Turkey, and most other Mohammedan countries. The victims generally fall quite independently of creed, nationality, or relationship. And, although a good deal of religious fanaticism may be induced in the *melée*, I do not think from what I know of Pahang Malays that the pure Mohammedan religion has anything to do with amok. The religion of the Malay native is, speaking generally, made up of a superstitious and very conservative belief in old charms and magic as well as public worship at the mosques and high places.

As far as the unpremeditated murders of amok go I think that the laws of the Koran relating to murder clearly support the opinion, except perhaps in some cases of "false amok." I doubt whether the ordinary Pahang villager has ever studied these laws, but the question seems to be of little importance, because doubtless Malays have been carried away by the blind passion of amok long before the comparatively modern conversion of the race to Mohammedanism. Indeed the occurrence was much more prevalent in the old days, and as Mr. Clifford says in his Dictionary, the advance of civilisation has done much to repress this peculiarity of the Malays, and amok running is becoming yearly more rare.

The mental upheaval of amok has some of the clinical features of epileptic mania. There is impulsiveness, violence, homicide, and destructiveness. Mr. Clifford notes that a man who runs amok may purposely collect and destroy his most valuable possessions.

It seems to resemble also very closely the automatic condition left after an epileptic fit, more particularly the so-called "procurive" or "procursive" epilepsy, in which the patient starts to run. To "run amuck" is a universal expression.

The red vision, or field of blood, which has been described in some cases of amok, is also significant of an epileptic aura, but there seem to be no motor or visceral aura.

Although, according to Trousseau (Trousseau's "Clinical Medicine," vol. i., p. 67), Mohammed himself was said to be an epileptic, I have not yet seen or recognised either petit-mal or haut-mal in Pahang Mohammedans, nor the more or less regular manifestations of epileptic larvae.

There is no history of Man having had fits during childhood, and he has had none of the ordinary signs of epilepsy since he has been under observation.

At his trial, on October 8, 1900, he was judged to be insane chiefly on account of the fact that he had loss of memory, which, coupled with the previous history of delusion and hallucination, was sufficient to allow that he had been unconscious of his actions when he ran amok.

The demeanour of the prisoner in Court was curious—he was no longer depressed. His spirits seemed to rise and he was almost excited at times; he had loss of memory for names of places, and was evidently not alive to the fact that he was being tried for his life. He was transferred to the Selangor Asylum on November 29, 1900.

The future history of this case will be of great interest. It may supply material for reflection with regard to the recurrence of symptoms which sometimes occur in amok, and thus prove of general as well as special interest.

NOTES ON INTESTINAL WORMS IN NATIVES OF BRITISH CENTRAL AFRICA.

By C. W. DANIELS, M.B.

THERE is considerable difficulty in obtaining a large series of stools from natives of this part of Africa, as they are suspicious of things they do not understand.

Most of the examinations recorded are of the stools of adult males. The stools were examined for the ova, the worms were not looked for.

The list includes only unselected cases, any results in selected cases are mentioned separately.

TABLE SHOWING THE ENTOZOA FOUND IN NATIVES IN BRITISH CENTRAL AFRICA.

	Number of Stools examined	NUMBER WITH				
		Anchylostomes	Lumbrici	Tricocephalus	Anguilula	Bilharzia (Rectal)
Shire Highlands ..	83	2	10	4	..	..
Angoni Highlands ..	26	2	..	..	..	..
M'langi Highlands..	6	..	2	1	..	..
Lake Shire (Nyassa)	62	12	2	..	2	..
Upper Shire River ..	48	1	1	1	..	..
Lower Shire River ..	26	8	..	1	1	1
Total	251	25	15	7	3	1
Percentages ..		10.8	6.5	3	1.3	.43

The figures show a small infestation by intestinal worms as compared with other tropical countries.

In British Guiana, amongst male adult negroes, 36.5 per cent. have anchylostomes, 25 per cent. lumbrici, and 16 per cent. tricocephalus dispar; and amongst the Indian immigrants 65 per cent. have anchylostomes, 21 per cent. lumbrici, and 13 per cent. tricocephalus dispar.

In Zanzibar, out of 35 examined, anchlostomes were found in 7, lumbrici in 8, and tricocephali in 8.

At Mombasa (British East Africa), out of 30, anchylostomes were found in 8, lumbrici in 1, tricocephalus in 2, and tænia (saginata?) in 2.

The parasite to which most interest is attached is the anchylostome, and it will be observed that not only is the percentage low as compared with British Guiana or India for the whole series, but also that in the Highlands it is much more so.

As a rule very few eggs were found, but in some cases selected on the Lower Shire, on account of anæmia, they were present in considerable numbers.

Anæmia is a very rare disease in the Shire Highlands. During the year 1899, Dr. McVicar informs me that out of 324 in-patients admitted there was not one of this complaint, and that it was very rare amongst the out-patients.

It is not a cause of rejection of recruits or of invaliding amongst the native armed forces.

The cases of anæmia I saw amongst the natives were not marked, and were usually associated with bilharzia hæmatobia, but in three of the most marked examined on the Lower Shire, abundant anchylostome ova were found in each.

The other entozoa call for little remark. The presence of anguilulla was not associated with any symptoms nor was the case of rectal bilharzia in the list, though in another (selected case) there was blood and mucus, and it had been diagnosed as dysentery.

Nearly all the cases of dysentery examined were associated with amœba coli, and this parasite was not found in any of the other stools.

No new entozoa were found.

Tape worms are said to be fairly common both on the Lower Shire and at the north end of Lake Nyassa, but I was not able to obtain specimens.

Bilharzia as a cause of hæmaturia is common in all districts, but vesical calculus is said to be unknown.

AN EASY METHOD OF MOUNTING MOSQUITOES.

By I. CROPPER, M.B., B.C.

SOME time ago, medical men residing abroad received instructions from the British Museum for securing and mounting or setting mosquitoes. I am afraid that the response was very small, and mainly for two reasons—we had not the apparatus, pins, &c., nor were most of us entomologists in even the narrower sense of the term. I write now to suggest a simple and effective way of doing the above. All that is necessary is a number of pieces of "leather board," i.e., brown cardboard of which boxes are made, of the size of a microscope slide.

3 in. by 1 in., punched with a gun-wad punch five-eighths in diameter. These can be easily fixed to slides by glue or Canada balsam. A second glass slide fixed to the other side of the cardboard slip makes the whole complete. It can be fixed by a gummed label (or otherwise), and on this details of capture, date, &c., can be noted. The mosquito could be fixed to the glass by a minute drop of Canada balsam or by the tips of the wings. In this way the whole mosquito is readily available for inspection. In the above I have adopted suggestions from both Dr. Manson and Major Giles, I.M.S., who kindly advised me in the matter. As suggested by the latter, a little creasote brushed over the edge of the cardboard slip would prevent mould. Entomologists will of course prefer pinned specimens, but it is not likely that those who have never pinned even a small moth, would find it possible to succeed with mosquitoes without a great deal of practice and time.

I have shown the above to Dr. Manson and Dr. C. W. Daniels, who think well of it, and I trust that those who are interested in the study of malaria abroad will find the method useful.

The slides complete (if thin "slips" are used) will pack safely in one of the post-boxes supplied by the opticians, and Messrs. C. Baker, of 244, High Holborn, will supply cardboard slips, if desired, at 5s., or, if fixed to slides, at 15s. per gross.

THE PREVALENCE OF PINTA ON THE GOLD COAST.

By OSBORNE BROWNE, M.B., C.M.

DR. EDGAR (JOURNAL OF TROPICAL MEDICINE, February 15, 1901) and again Dr. Buchanan (JOURNAL OF TROPICAL MEDICINE, April 15, 1901) both allude to pinta as a disease of Tropical America. I found it very common on the Gold Coast where the natives erroneously attribute it to yaws, although the latter disease may have occurred years before the pinta. *At first it begins as a very itchy dark bluish or black spot as a rule on the back of the hand or dorsum of the foot; although it not so unrarely extends to the palms or soles.* When the disease has gone on for a considerable time it has lost its initial dark colour at all events in places, and is succeeded by a greyish pink or white colour denoting a loss of the natural pigment of the skin. From conversations with natives it was said by them to extend into Hausaland about Kano, where it is called tungere. The fungus is in all cases identical. Natives may also lose the pigment from their skin by a burn, wound, or old parasitic diseases (including pinta) long since died out.

GEOGRAPHICAL DISTRIBUTION OF DISEASE.—It will be observed at page 194 that Dr. Preston Maxwell states that scarlet fever, diphtheria, and rheumatic fever are not met with in the Changpoo Valley of the Fokien Province of China; chronic granular kidney and rickets are practically unknown; chorea and Charcot's disease are never seen; and endocarditis is the rarest of affections.

BLACKWOOD recommends the administration of euquinine instead of quinine in fevers of various origins, and considers it especially adapted for the use of women and children. He has given it with the most favourable results in doses of 1·8 grs. evoking any discomfort, though, as a rule, smaller doses suffice (0·1 to 0·3 gr.), as euquinine in its effects is twice as strong as quinine. It is best taken in milk, broth, malt extract, or wine.

Sweating of Feet:

Balsam Peru	..	..	..	15 min.
Formic Acid	..	..	..	1 dr.
Chloral Hydrate	..	..	..	1 dr.
Alcohol	..	..	to make	3 oz.

Apply by means of absorbent cotton.

In Malarial Anæmia:

Iron and Quinine Citrate	..	..	..	1 dr.
Capsicum	..	..	..	2 grn.
Ext. Taraxacum	..	..	to make	12 pills

One pill after each meal.

Arsenous Acid	..	..	..	½ grn.
Euquinine	..	..	..	80 grn.
Dried Iron Sulphate	..	..	..	40 grn.
Strychnine Sulphate	..	..	..	½ grn.

Make into 20 pills. One three times daily.

In Pernicious Anæmia:

Arsenous Acid	..	..	..	1 grn.
Ext. Nux Vomica	..	..	..	10 grn.
Hemogallol	..	..	..	150 grn.
Mucilage Acacia	..	..	..	to make 60 pills
Sugar	..	..	..

Two three times daily after meals.

Antiseptic Dusting Powder:

Salol	..	..	..	4 dr.
Zinc Sulphate	..	..	..	6 dr.
Powd. Benzoin	..	..	..	2 dr.
Powd. Talcum	..	..	..	8 dr.
Oil Fennel	..	..	..	7 min.

Thoroughly triturate until a fine powder is made and use freely. Of use in treatment of chronic ulcers and suppurating sores, as an iodoform substitute.

Cholera Morbus:

Very hot turpentine stupes, consisting of a tablespoonful of turpentine oil to the quart of water; and internally:

Comp. Spt. Ether	..	..	..	2 dr.
Comp. Spt. Lavender	..	..	..	2 dr.
Camph. Tinc. Opium	..	..	..	15 min.
Tinct. Capsicum	..	..	..	2 dr.
Tinct. Ginger	..	..	..	2 dr.

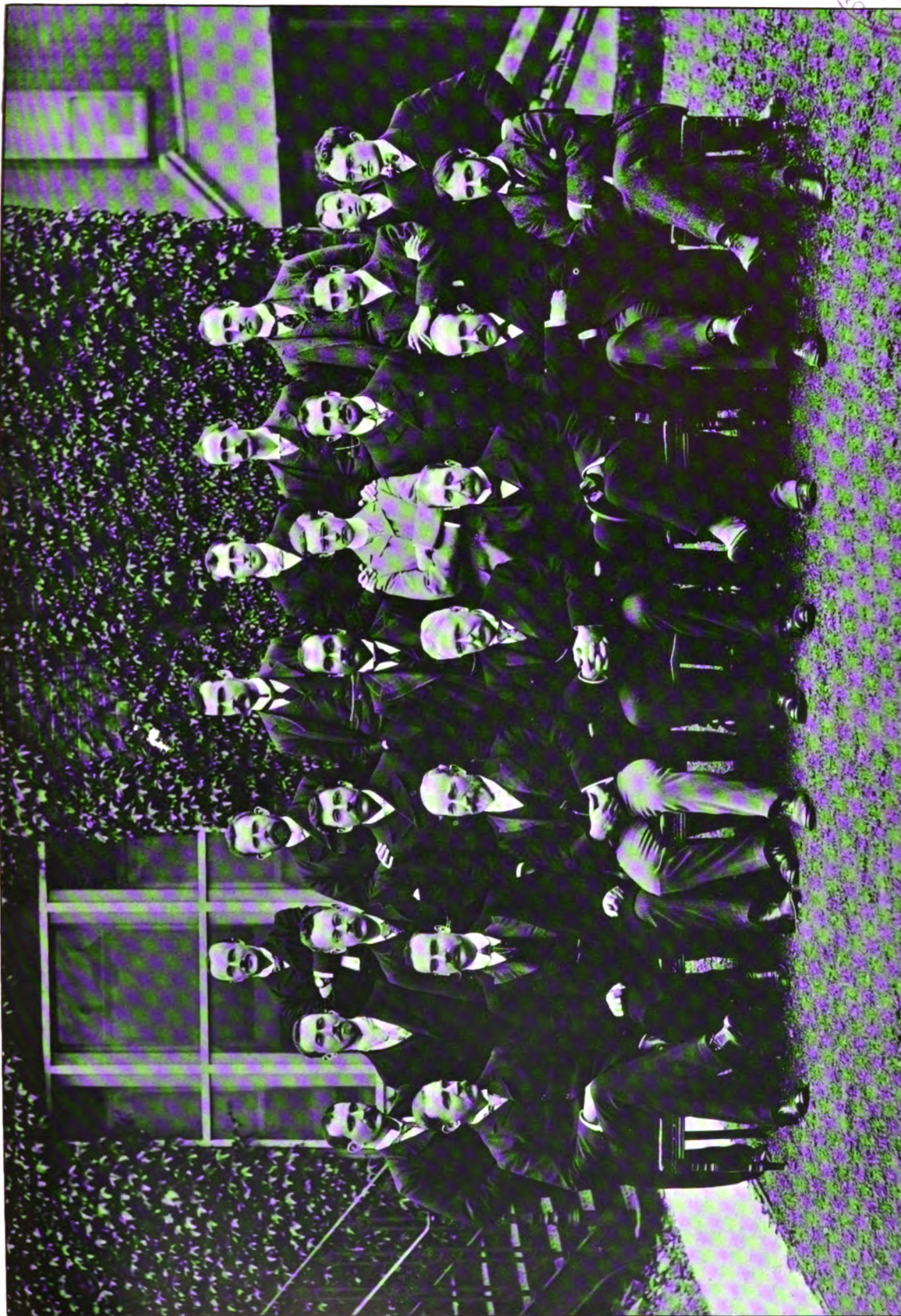
One-half to one teaspoonful every two hours.

Merck's Archives, May, 1901.

WHOOPIING-COUGH IN RANGOON.—We are indebted to Lt.-Col. Oswald Baker, M.D., Physician to the Seamen's Hospital Society, for the following communication and comments:—

A Rangoon newspaper states that: "On the recommendation of the P. M. O., Rangoon, the schools in Cantonments have been closed for all children under 10 years of age during the present prevailing epidemic of whooping-cough."

Lt.-Col. Baker remarks that: "With respect to the enclosed extract, cut from the last Rangoon newspaper to hand, it may interest your readers to learn that this is, I believe, the first occasion within recent times in which whooping-cough has occurred in Rangoon in an epidemic form. That epidemics of the disease may have prevailed in years gone by is possible, but it is my firm conviction that there has not been any previous epidemic outbreak of whooping-cough in Burma within the last twenty-five years."



SOME OF THE TEACHERS AND STUDENTS ATTENDING THE LONDON SCHOOL OF TROPICAL MEDICINE,
Summer Session, 1901.

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THE

Journal of Tropical Medicine

JUNE 15, 1901.

THE PERSISTENCY OF PLAGUE.

HONG KONG is now passing through a severe recrudescence of plague, the seventh definite outbreak within eight years. Since the spring of 1894 the colony has had a recurrence every year except during 1895; nor does the virulence of the disease abate, for the present epidemic seems the most fatal of all. Over a thousand deaths from plague are already reported for this year, and the disease is only just attaining the maximum of its fatality. Regarding plague and its tenacity of place we naturally turn to Hong Kong for guidance; this being the first place in the world where the present pandemic of plague was brought to the knowledge of a European community. But whether it is Hong Kong, Bombay, or any of the large towns in the Bombay district, the persistency of plague has proved itself a factor in the disease, which thrusts itself upon

the inhabitants of any infected city in a manner which can be regarded as little short of appalling. From what is known of plague, by its behaviour in Hong Kong, we must expect when once a town is infected, that recurrences are not only possible but that they will continue with an inveterate persistency rendering the future, from a public health and a commercial point of view, gloomy in the extreme. In past centuries the same lesson was keenly brought home to us, for the last time plague visited London it lasted some seventy years. We had hope that modern sanitation would have stayed the disease and arrested its continuance; but this hope seems a broken reed as far at least as Asiatic cities are concerned. In Hong Kong we have a city built upon a hill-face, with a pure water supply, with the most modern forms of drainage opening into a harbour swept by strong currents, and with the sanitation of the town carefully inspected and attended to under European supervision. With all these advantages Hong Kong is in no better position as regards recurrences of plague and their virulence than is any one of the adjacent Chinese towns and villages. In Bombay the adaptations of modern sanitary principles have been adopted and applied, yet plague retains its hold in as virulent a form as in any village in the semi-desert regions of Rajaputana.

In explanation of the malignant pertinacity of the recrudescence in Asiatic cities it had come to be believed that the natives of China and India were peculiarly susceptible to plague, and that Europeans, owing to their more sanitary ways of living, were well nigh immune. This belief is, however, not founded on fact. In Capetown at the present moment the Europeans are suffering from plague in almost equally proportionate numbers to the coloured people. The number of seizures and deaths amongst Europeans in Capetown has exceeded that of any other town in which Europeans and coloured natives exist side by side. But Capetown is peopled by men and women from many countries, and of all the immigrant or native communities in Capetown, the Chinese, who are in considerable numbers, have suffered least from plague.

Next to the Chinese in immunity range the Malays; so that although two typically oriental peoples are dwelling in the midst of a British community, they are practically free from a disease which has hitherto selected orientals as its victims, wherever inhabitants of Europe and Asia dwell together. Racial immunity and racial incidence seem to play no part in the onset of plague, household and personal cleanliness would seem to have little to do with the spread of the disease, nor can public sanitation claim that it has done much to thwart plague in its virulence or in its spread.

The dread of plague reaching a country after a study of its behaviour in Hong Kong and elsewhere is well grounded, and it behoves the sanitary authorities, both in the east and west of Europe, to keep strict watch upon their frontiers and shores, for plague once admitted is no respecter of race or locality, and it would seem to defy the efforts of all public health measures to eradicate its ravages or prevent its recurrences when once it has become established.

Translations.

FRAMBÆSIA TROPICA IN SUMATRA.

By Dr. L. MARTIN.

(Translated from the German by P. Falcke.)

It is only of the least specific of the tropical diseases that German literature furnishes exhaustive histories, yet such histories are full of interest, and give the tropical practitioner a more distinct picture of the affection than the most minute essays in the best handbooks.

Working from this standpoint, the practical sparsity of which I have so frequently deplored, I will communicate the cases of *frambæsia tropica* which came under my observation during the course of a year (from April 1, 1899, to April 1, 1900), in the coolie hospital, "Bangkatan," under my charge, and situated in Bindjei, Delui, on the east coast of Sumatra.

CASE 1.—A Javanese, Mentowikromo, 25 years of age, had been in Sumatra for three years, and was a coolie on the tobacco plantation, Kwala Minchirim. He was admitted to the hospital on December 18, 1899. He asserted that in his native island, Java, he had already suffered from "patek," a statement that was confirmed by the presence of various dark pigmented scars. Both his parents, as also a younger

brother, had had the same ailment; he denied ever having had a venereal disease; there were no cicatrices on the genitals, but the inguinal and crural glands were enlarged. His present illness had developed fourteen days previously without apparent cause. One morning on going to work he had pains on the soles of the feet, every contact with the hard ground, with small stones, even with the sward, being painful, so that, at the present time, he is quite incapacitated from walking or working. The patient otherwise is quite healthy, has no fever, his appetite normal. On the sole of the foot, in three different places, i.e., the dorsum of the big toe, the ball of the big toe, and in the arch of the sole of the foot near the outer border, there are seen irregularly shaped, raspberry-like papillomata, which overlap the surrounding skin by about 1 cm.; they bleed readily, and are surrounded by pus and macerated epidermis. These papillomata on being pressed retire beneath the partly undermined loosened layers of the cracks; the odour is foetid, but by no means specific. After cleansing the foot, which is much begrimed with soil, with a solution of sublimate, the epidermis around the papilloma is removed by means of the curved scissors as far down and as deep as possible; the same is done with the free papillomata, the bases or pedicles of which, moreover, are energetically treated with the sharp spoon without, however, evoking much bleeding. It is then seen that the flattened papillomata extend deep beneath the undermined epidermis. As this operation is fairly painful, the foot of the patient, who is recumbent on the operation table, is to be firmly held by hospital assistants. After styptics have been applied to the flat ulcerative surface, it is macerated with a 3 per cent. alcoholic solution of sublimate on a pad of medicated wool of the same size as the ulcer, a piece of lint streaked with unguentum cinereum is applied, then a layer of dry wadding, and a bandage of cambric. The bandages, &c., are changed every other day, and on December 29 it is found that two ulcers are quite healed, and the one on the edge of the foot exhibited a smooth, clean, granulating surface about the size of a penny. The pain had completely disappeared, and walking was possible. On January 1, 1900, the last ulcer had cicatrised, but as the scars were still soft and tender, the patient was retained in the hospital, his foot being kept bandaged until January 4.

CASE 2.—A Javanese, Tomis, 35 years of age, who has been nine years in Sumatra, a coolie on the tobacco plantation, Kwala Minchirim. He was admitted to hospital on December 18, 1899. He states that while still in Java he had suffered from "patek," his mother, sisters and brother having also had the same ailment. He denies ever having had a venereal complaint, but the inguinal and crural glands are distinctly enlarged. A fortnight ago, and from no cause whatever, the present affection had revealed itself, and made it impossible for him to walk on account of the severe pain on the soles of the feet when touching the ground. Patient otherwise is quite healthy, is of robust appearance, has no fever, and an excellent appetite.

On the sole of the right foot, on the ball behind the fourth and fifth toes, and on about the middle of the

heel, there are raspberry-like papillomata of longish, irregular shape, which have forced themselves through the thickened, half-macerated epidermis, which is discoloured to a whitish hue at the places of contact, undermined with pus and of a fœtid odour. The papillomata protrude about 0.5 cm. over the healthy skin. The same treatment and similar bandages as in Case 1 are adopted, and in this case also the removal of the scales of epidermis reveals radiated flattened processes of the papilloma. The patient was discharged on January 1, 1900, entirely cured.

CASE 3.—A Javanese, Tirtowongso, 35 years of age, has been in Sumatra eight years, is water-carrier to Mr. K.; admitted to the hospital on January 13, 1900. He states that in Java, as a child as also when grown up, and later on also in Sumatra about one and a half years previously, he had suffered from "patek." He had no recollection as to whether his parents had had the disease, but remembered that his brothers suffered from it.

With the exception of gonorrhœa patient had no venereal history; on the penis the cicatrix of the operative incision is remarkably distinct, the inguinal and crural glands are enlarged and the cicatrix of a bubo is apparent over the left crural gland. Ten days ago the present ailment came on, without his being able to ascribe a cause. Patient, otherwise well and hearty, exhibited on the sole of the left foot a roundish opening of the thick-fissured epidermis, about the size of a five-shilling piece, taking in nearly the whole of the heel; its edges were undermined and filled with disintegrated debris of epidermis and particles of earth and emitted a disagreeable smell reminiscent of sour, clotted milk. From the hole thus formed there emerged a smooth, roundish, raspberry-like swelling about 1 c.m. in height, but which nevertheless had not excoriated and did not bleed. A similar but smaller elongated swelling was to be seen under the ball of the foot. The corneous, thickened epidermis was removed from both ulcerations as far as possible, revealing a peculiar zig-zag formation of the epidermis, reminding one of the horn of a stag, or the formation of coral; it had not deliquesced and stood out pure white from the surrounding detritus. This appearance, which is characteristic of frambœsia, was also cut away with the scissors, detritus and raspberry-like prominences thoroughly removed, and the surface of the wound, which was considerably larger than the originally perceptible papillomata, treated and bandaged as Case 1.

After continuing the treatment and changing the bandages every other day, the patient was discharged from hospital, cured and capable of work, on February 1, 1900.

CASE 4.—Javanese, Signotono, aged 30, has been in Sumatra four years, is coolie on the tobacco plantation, Poenge; admitted to hospital March 2, 1900. He states that he has had "patek" on his left hand for six weeks, has never had the illness previously, and can remember no case of the same in his family. He denies having had any venereal disease; there is no cicatrix on the penis, but the inguinal, as also the cervical and axillary glands, are distinctly enlarged. On admission there is found a raspberry-like swelling, the size of a dollar, in the palm of the left hand, at

the base of the third finger; this extends beyond the edges of the fissured epidermis, is covered with pus, and emits a foul odour. Another swelling of a similar size, clean but still very prominent, exists on the extensor aspect of the right wrist. The patient besides is suffering from a common, granulating ulcer on the shin of the right leg. Both papillomata were treated as above and bandaged, and on March 15 were completely healed, whereas the leg ulcer follows the usual chronic course, and on April 4 is still the size of a finger nail. On March 29 and without any prodromal symptoms, a secondary frambœsial eruption broke out on the face, and there were sixteen small papillomata, varying in size from a lentil to a hazel nut, on all parts of the face; these resembled condylomata, but disappeared quickly under the above method of treatment, i.e., removal with the scissors, cleaning with 3 per cent. solution of sublimate and inunction with unguentum cinereum. Iodide of potassium was administered internally.

CASE 5.—Javanese, Kromosora, 40 years of age, has been in Java twelve years and is employed as coolie on the tobacco plantation of Kivala Minchirim. Admitted to hospital on November 11, 1899, where he had previously been under treatment for frambœsia of both feet from June 7 to July 4, 1899. On that occasion he had been laid up for a month before he came to hospital for treatment, and on this occasion he had already suffered from the illness for a month. On the left leg there are two prominent papillomata of irregular shape, raised about 1.0 or 1.5 cm.; one on the outer side half way up the leg, the second in the middle of the calf. Treatment and bandaging as in Case 1. The patient was discharged cured on December 23, 1899.

CASES 6 and 7.—Javanese, Kassandarmo, 35 years of age, has been six years in Sumatra, and Alibesari, 25 years of age, has been one year in Sumatra; both are coolies on the tobacco plantation, Tandjong Djatti. The former had been ill a fortnight, the latter a month; they received the same treatment in hospital with the same result. In Kassandarmo the papillomata were on the leg, and in his case there had doubtless been syphilitic infection. Alibesari exhibited the usual frambœsial swellings on the sole of the foot.

The above seven cases are the only examples of frambœsia tropica or polypapilloma tropica which came under my treatment during a whole year, from amongst a total of 1,353 Chinese, Javanese, and Tamils. It will therefore be seen that the affection is a relatively rare one amongst the native workers on the tobacco plantations on the west coast of Sumatra, and seems only to come under observation amongst the Javanese. Notwithstanding the great number of Chinese—about 8,000 came under treatment at the hospital, Bangkaton—who were in daily intimate connection with the Javanese and their wives, and who always went barefooted in their daily life and in the field, no Chinese coolies suffering with frambœsia ever came under observation, nor did Europeans; the latter, however, are protected from infection, which mostly attacks the feet, by always wearing shoes or slippers. It was also found that no further infections ever originated from the cases admitted to hospital; it will be distinctly seen from the history of disease imparted by

the patients that infections often occurred from member to member of one family owing to the intimate connection of their family life.

There is no doubt, however, that if the Javanese and Malayan villages, the inhabitants of which rarely come into contact with European doctors, were examined, far greater numbers of persons suffering with frambœsia would be found. The disease is a purely local one, has no prodromal symptoms, and causes no general indisposition, for all my patients rejoiced in the most robust health.

The Javanese, when the affection is localised on the sole of the foot, call it "bubul" and otherwise "patek" ("paku" in Soudanese). Though bubul affects walking and therefore labour, it does not call for much attention, the persons affected recognising that it is a purely local affection without general symptoms. They, however, assert that pains in the bones (*sabkit toelang*) set in if the bubul or patek does not break out. They treat the papillomata exclusively with frequent paintings with sulphate of copper; this inefficient treatment causes the sufferers much pain, and the places only heal after months of treatment.

The seven patients were all comparatively young, between 25 and 40 years of age, but there is no doubt that most of the illnesses take place at a much younger age, the age of childhood. I distinctly remember that when passing Javanese or Malayan settlements I always remarked several sufferers from frambœsia amongst the crowds of romping children. In children the face and hands are more frequently the seat of the disease than in adults, whose legs and the soles of whose feet—the latter in quite a typical manner—are generally attacked. In the face the papillomata are certainly seen on the border of the skin and mucous membrane, but I have never been able to confirm the same on the mucous membrane itself, nor on the anus; on the latter locality it is doubtless a question of condylomata, never of frambœsia. When the complaint is localised on the sole of the foot, the papillomata visible externally never correspond with the actual extent of the affection, and operative treatment bears evidence that great mistakes may be made in this particular. As the sole of the foot amongst barefooted people acquires an enormously thick corneous layer, the suppuration, which produces the papilloma originating from the papillary bodies, is not able to disperse the masses of epidermis, loosened patches remain intact, and beneath these nests of flattened papillomata are formed, and thus is originated the typical coral-like formation described above in the histories of cases, and which consist of branches of corneous layers, as yet not dissolved. In order to bring about complete recovery, all these concealed agglomerations of papillomata, which are radiated, fissured processes of the principal visible swelling under the intact epidermis, must be completely removed, so that treatment is possible, and though the operation in itself is simple in the extreme it is a wearisome one, requiring the exercise of patience by both surgeon and patient. This explains why the treatment of the Javanese with copper takes so long; it stands to reason that here only the visible part of the frambœsia is cauterised, and months elapse before the processes of papillomata

hidden beneath the corneous layer a cm. thick are laid open and can be treated. Generally some fine mud, originating from the roads softened by rain, penetrates beneath the epidermis by means of the perforations formed by the principal papilloma; this is exhibited as a thin black coating under the epidermis, loosened by the papillary processes and undermined by their sections; on the line of section the mud has the appearance of a black linear border. Where this border is to be seen one may with safety continue to remove the epidermis, for papilloma will certainly be found there.

The frequent relapses of Javanese may partly be explained by the fact that, whereas the superficial papillomata are cured by treatment, a few more deeply situated centres continue to exist, and only after weeks or months break through the cutis in their turn, and superimpose a fresh illness. The conditions in "patek" are much simpler; the papilloma in their whole extent being laid open, and only in the palm of the hand can conditions similar to those on the soles of the feet, but to a less degree, prevail.

A further difference between bubul and patek is that in the latter the swellings are relatively much less tender than in bubul, where, corresponding to the region of the nerves of the sole of foot, the ailment is a very painful one. The slightest pressure on the papillomata of the feet induces an immediate severe pain, and walking therefore becomes an impossibility.

Patients with bubul on their heels have to walk on tip toe. I could not confirm the statement that a specific odour is attached to this complaint; the cleansed papilloma had no odour at all, whereas those that were surrounded by detritus, half-melted skin and particles of soil, only had the usual foetid smell which is also perceptible in onychia, caries, &c. The lymphatic glands, particularly the crural and inguinal glands, showed themselves enlarged and infiltrated, and in all cases where the localisation was in the hand the elbow glands were likewise affected. If, in the cases cited, it was a question of frambœsia itself, or a previous infection with lues, and in the case of children of inherited syphilis, it is very difficult to decide. The coolies coming under treatment did not belong to the best and most moral classes of Javanese; they came from ports more or less soaked with syphilis, so that the possibility of a previous infection with syphilis cannot be excluded. Suppuration of the lymphatic glands cannot be confirmed; in any case the buboes observed may be attributed to a simultaneous infection with streptococcus or staphylococcus.

The cases instanced further teach us that in frambœsia frequent relapses are the rule, and that one recovery from the illness by no means provides protection against new eruptions. Nearly all the patients had suffered formerly from the complaint, and Kromosaro (Case 5) had two eruptions in one year. Serious consequences such as gangrene and caries have been mentioned by various authors, but personally I have never seen any. The remaining cicatrices were always deeply pigmented; in the Javanese they were blackish brown, while white cicatrices without pigment belong to the region of lues. As to the prognosis of the affection, it is, as Scheube with justice says in his

handbook *Krankheiten der warmen Länder*, a favourable one. Nevertheless I do not regard the illness as capable of spontaneous recovery, for to attain this months or even years must elapse, owing no doubt to the uncleanness and bad habits of the natives. The patients whose cases are here given had, one and all, suffered with the complaints for some time previous to their admission to hospital (from ten days to six weeks), and they would not have sought European aid if their own methods had not failed. It need not be further discussed what consequences may follow if a Javanese with a frambœsial swelling on the sole of the foot neglects it, but it is possible it may prove fatal. The average duration of hospital treatment is about three weeks, this period including the rest that is requisite for the hardening of the cicatrices.

The diagnosis in typical cases presents no difficulties, but the suspicion of co-existent lues (tertiary or congenital in children) must always be taken into account, and the absolute exclusion of syphilis amongst the people of the coolie class cannot be relied on. This suspicion is always strengthened by the application of the above-mentioned treatment, and besides, all authors coincide as to the curative influence of the continuous administration of iodide of potassium, and this treatment was always followed in Bangkaton Hospital. The removal and scraping out of the frambœsial swellings is always very painful, and the Javanese individually vary in their sensibility as to pain. Whereas one man hardly moves a muscle when under operation, another man must be placed under an anæsthetic in order to thoroughly carry out the treatment necessary for the cure.—*Archiv für Schiff und Tropen Hygiene*, June, 1901.

THE PURIFICATION OF WATER IN CAMPAIGNS.

MAJOR W. G. MACPHERSON, M.B., draws attention to the difficulties of the purification of water during campaigns, in *Public Health* for June, 1901. The recent modifications, which have been lately advanced, consist chiefly in the method of biological sterilisation in contradistinction to the older method of oxidation of the organic impurities. During war the means and methods of purification must be of the simplest possible character, so that time, carriage and expense may be saved. It is evident that plans of purification of water for cities and stationary hospitals are, for the most part, inapplicable at the front. It must also be remembered that there are usually two factors to be considered in purifying water, namely, sterilisation and clarification, and the ideal method of purification is the one which combines these processes. The several known methods come under one of three headings, namely, boiling, the use of chemical agents, and filtration.

(a) *Boiling*.—Simplicity and efficiency commend boiling as a means of dealing with suspicious water, but the means of carrying it out at the front are seldom at hand. The impedimenta necessary to ensure efficiency by this method, such as apparatus, fuel, &c., are insurmountable obstacles to its use, and

the time which must elapse before the water is fit to be consumed is a great drawback. Special apparatus designed to economise fuel, to rapidly cool the water, and to boil without the loss of the dissolved gases in the water have been manufactured and tested practically. Of these the best known are the (1) Villiard-Desmaroux, (2) the Maiche, (3) the Waterhouse-Forbes. None of these however, clarify water, and until this can be combined along with purification by heat, perfection of water purification cannot be said to be obtained.

(b) *Sterilisation by Chemical Agents*.—The difficulty in the application of sterilisation by chemical agents lies in the production of an agent which is at once reliable, innocuous, and tasteless. Permanganate of potash has long been used as a prophylactic against cholera, but it is an inefficient germicide for bacteria of most other diseases. Of other methods the best known are: (1) Lepeyrière's, which consists of permanganate of potash combined with alum, and the carbonates of sodium and calcium. (2) The Austrian method, in which the hypochlorite of calcium (02 gramme to a litre of water) is used. (3) Bergé's, of Brussels, method by peroxide of chlorine; for which it is claimed that the water is sterilised, clarified, and produced without affecting the taste. (4) Schumberg's method by adding bromine (06 gramme to the litre) to the water. The unpalatableness incident to the use of bromine is remedied by the addition of small quantities of hyposulphite and carbonate of sodium. This method was tested on a large scale during the Soudan campaign, and the chief disadvantage accruing to the method is the time it takes. (5) Parkes and Rideal claim to have discovered a reliable germicide in disulphate of sodium. Seeing that this salt can be made up into tabloids ready for use, its efficiency is enhanced thereby.

(c) *Filtration*.—The chief objection to filters is that they get choked by muddy water. This has been greatly obviated by the addition of the air-pressure chamber in the Berkefeld Field Service filter, which has rendered the filter very reliable as a sterilising filter. There is no doubt that purification by the single-bougie pressure filters is best suited for the individual soldier, and if they are carefully used and cared for by men trained to look after them, meet most of the requirements during war. For general garrison purposes the "many-bougie filters" are best adapted. Major Macpherson remarks that the use of chemical methods by individual soldiers can never be generally applied with any prospect of success, and that for this as for every form of purification it is necessary that the individual officer and men be instructed in the principle of water purification, and in the practical use of some one or more methods.

Unfortunately, the great scourge of armies—enteric fever—is spread by other means than by drinking water, and that, although the purification of water is no doubt the chief goal to be aimed at, there are other lurking dangers to be combated whenever and wherever soldiers are brought together into hastily constructed camps, or when the exigencies of war curtail the more elaborate necessities of sanitation.

MASSACHUSETTS GENERAL HOSPITAL.
THE OCCURRENCE OF FILARIA AND ELEPHANTIASIS IN SOUTH CAROLINA, U.S.A.

DR. H. F. VICKERY showed a case of elephantiasis of moderate degree in a mulatto woman who was born in South Carolina, and was seventeen years old when she entered the wards last September. She came in on account of symptoms which were easily explained by a marked chlorosis which she had, the hæmoglobin being only 50 per cent. of normal; but the object of interest to us was her right leg, below the knee and including part of the foot. The leg was symmetrically enlarged; the hair follicles somewhat farther apart than on the normal leg, and the hairs rather more luxuriant. The enlargement was apparently due to hypertrophy of the skin and the subjacent connective tissue. The X-rays showed no difference in the bones. The case was seen by Dr. Bowen, who agreed with me that it was a sort of elephantiasis.

True elephantiasis of tropical origin is due to the presence of the *Filaria sanguinis nocturna*, although the filaria cannot, as a rule, be found in the general circulation in these cases, being confined by the choking up of the lymph glands of the diseased part with the eggs of the filaria. Repeatedly the blood of this patient was examined day and night, both from the leg and from other parts, but no filaria was discovered. Unlike cases of ordinary elephantiasis, she never had any erysipelatous attacks in the leg. This leg measured the same size as both her thighs, nearly 41 centimetres.

Dr. WHITE said: It seems to me that the case is one rather of false than true elephantiasis due to the presence of filaria. The occurrence, in the early stages of the latter, of attacks of erysipelas-like dermatitis are almost constant, and I was not aware until Dr. Vickery so stated that this filaria is found as far north as South Carolina. These sporadic cases which occur in northern regions are looked upon rather as non-parasitic, and are called false elephantiasis on that account, due to some condition of the lymph vessels, not a mechanical stoppage by the filaria, but to other processes which lead to precisely the same results.

MOSQUITOES COLLECTED IN HONG KONG
DURING THE FIRST QUARTER OF 1901.

REPORT BY DR J. C. THOMSON, M.A., M.D.

FROM the majority of the various police districts into which the Crown Colony of Hong Kong is divided, specimens have been regularly sent for examination during the months of January, February, and March, 1901. In all, some 7,490 mosquitoes have been received and examined, and the numbers as regards the proportion of *Anopheles* to *Culex* mosquitoes proved respectively to be 227 (3 per cent.) and 7,263. For the three months the numbers of *Anopheles* were, for January 143, February 35, and March 49. These numbers coincide in their rise and fall with the prevalence

of malaria in the colony, for during either February or March in most years the cases of malarial fever reach their minimum. The *Anopheles* found could all be apportioned under two species, and the *Culex* were found to belong to five species.

Dr. Thomson adds some useful hints as to collection. The mosquitoes should be caught by means of glass test tubes and killed by a few whiffs of smoke. No packing of any kind is necessary other than the wrapping of the box in a piece of paper. Mosquitoes should be examined within twenty-four hours after capture, as after that time they become dry, they tend to break up, and classification of them is less satisfactory.

TRINIDAD—ANNUAL REPORT OF THE
SURGEON-GENERAL FOR 1900.

THE report by Sir Francis Lovell, C.M.G., and the medical officers in the Government service in Trinidad and Tobago, W. Indies, covers 106 folio pages. The completeness and care with which the report is produced is highly creditable to the medical staff, and of great interest from a scientific point of view. The diseases most frequently met with in Trinidad are malaria, dysentery, yaws, anæmia, ankylostomiasis, and "ulcers." Influenza prevailed as an epidemic during 1900, after an absence of four years.

YAWS.

In 1896 yaws had attained so wide a prevalence in Trinidad and Tobago that it was found necessary to introduce a "yaws ordinance." By this ordinance hospitals and dispensaries were specially opened for the treatment of yaws, and the notification of the disease was made compulsory. There were 963 cases of yaws under treatment in Trinidad during the year, and at the beginning of the year under review 767 were under treatment in Tobago.

Regarding the treatment of yaws at the Arima Yaws Hospital, Dr. F. de Verteuil remarks: "The treatment by *thyroid extract* has been continued throughout the year, and there can be no doubt that this drug is of the utmost value. Under its use the tubercles rapidly disappear and the general health seems to improve. I had to give up the use of *guaiacol*, as this drug was not well borne by the children, and did not seem to do much good in most of the cases in which it was tried. Of the other drugs, iodide of potassium, mercury, arsenic, &c., are given in suitable cases. But, as I have stated in my former report, strict hygienic rules, a nutritious diet and bathing, are essential in the treatment of yaws. Out of 126 persons treated in the hospital, 95 were discharged as cured, and amongst those latter were ten relapses. I have had frequent occasions of seeing a good many of the persons discharged during 1899 and 1900, and the cures appear to be permanent."

Dr. Charles F. Knox, in his report on the St. Clair Yaws Hospital, remarks regarding the treatment of yaws: "After a trial of several drugs, internally and externally, including *guaiacol*, *thyroid* and gland extract, I find the iodides, especially the iodide of

iron internally, with iodoform as an ointment or dissolved in oil externally, quite sufficient to effect a cure in most cases. Some of the cases have proved very rebellious to all treatment, but most of them get cured in from three to four months."

Dr. T. B. Kenny and Dr. R. C. Bennett, speaking of the treatment of yaws, seem to think that the present dispensary system in force, while it helps to keep the disease under, does not serve to eradicate it.

DYSENTERY

appears to have been less prevalent than in former years, 589 cases of dysentery only being met with during 1900, out of a total of 23,403 cases of all diseases.

WHOOPIING-COUGH.

prevailed as a mild epidemic in several districts.

CHICKEN POX

is reported as having been met with in the Arima district.

HEMOGLOBINURIC FEVER

is stated by Dr. A. Milner to have occurred in a girl aged 12 years in the Mayaro district. The girl died on the third day of the illness with complete suppression of urine. In the Cedros district also, Dr. C. W. Hewlett states that: "Four cases were reported as blackwater fever, one of them being fatal."

GROUND ITCH (PANI GHAO).

Dr. R. Seheult, in his report on the diseases of the San Fernando and Napurima district, remarks: "This disease appears to be identical with the 'Pani Ghao' or 'water sore' of Assam, and is very prevalent during the rainy season on the sugar plantations amongst the East Indian labourers. The duration of the disease varies from a few days to two to three weeks. Probably the disease is caused by some chemical irritant in the soil, and the manure which is used in the fields may have something to do with its causation, or it may possibly be a parasitic disease. It is not a serious ailment, but it causes a great amount of pain and discomfort to the patients, and is a matter of much importance to the planters, as it incapacitates so many labourers from doing their work. The question of introducing wooden clogs (Kurrams) to keep the feet off the ground, as suggested by a writer in the JOURNAL OF TROPICAL MEDICINE, is worthy of consideration."

Dr. J. W. Eakin, in his report on the South Napurima District, also states that he met with ground itch, and makes the following remark upon the nature of this ailment: "The disease appears to me to closely resemble pemphigus contagiosus in its general character, though differing from this latter affection in that it develops on the hands and feet, whilst pemphigus contagiosus seems to be confined mainly to the axillæ. Otherwise the two diseases appear to be identical, and I bring it to your notice in the hope that its pathology may be investigated and its nature defined."

Dr. E. J. Hammond, in the Savana Grande District, states that he met with a considerable number of cases of "ground itch."

MALARIA

Malarial fevers are reported upon as follows:—

Malarial Fever.		Cases Treated.
(a) Intermittent	Quotidian	40
	Tertian	854
	Quartan	—
	Irregular	8
	Type undiagnosed	—
(b) Remittent	... ..	225
(c) Pernicious	... ..	61
(d) Cachexia	... ..	53

It is interesting to note that the "undiagnosed" type of fevers are *nil*; this heading stands a good chance of disappearing from our nomenclature in view of the advance made in our knowledge of the parasite.

BERI-BERI.

Three cases of beri-beri were treated during the year 1900. The case reported by Dr. R. Seheult was of the "wet variety," and occurred in a European.

GUINEA WORM.

In two newly arrived East Indian immigrants guinea worms were found and extracted, one from the leg and another from the buttock of the patients.

TYPHOID FEVER.

Under the heading "Prevalence of Disease" on page 4 of the Report, it is stated that of a total of 23,403 cases of all diseases treated, *one* case only of typhoid fever was met with. Under the reports of the medical districts, however, several instances of typhoid are mentioned.

Drs. Darwent, Kenny, Percy, Seheult, all mention typhoid fever as having occurred in their districts or hospitals, and in the tabulated returns forty-five cases of enteric fever are noted. In no district is typhoid fever prevalent, and considering the state of over-crowding and sanitary neglect that many of the medical officers describe, it seems extraordinary how rare typhus and typhoid are. In fact no case of typhus fever is recorded, and the typhoids are wondrous few. One cannot help balancing the disproportion between the typhoid fever returns and the reported cases of remittent fever. The former number 45, the latter 225. In many British colonies typhoid had been reported as non-existent; but as years went on, the remittent group of fevers steadily diminished, and in proportion the enterics increased.

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We regret to have to announce the decease of Dr. Paul Kohlstock, which occurred at Tientsin, China, on April 15, at the early age of 40 years. He was a valuable contributor to our knowledge of tropical hygiene, more particularly malaria. In 1896 he accompanied Professor Koch to South Africa, and assisted in the investigation of cattle plague and rinderpest in Cape Colony.

Correspondence.

DOG TICKS AND BLACKWATER FEVER.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

SIR,—At the time when we sent to you our paper describing certain bodies found in the urine in cases of blackwater fever, it appeared probable that we should be able to examine other cases at a later date. As this does not now appear likely, we write to offer the following suggestion to any one who may have a case of blackwater fever in his care. Ascertain if the patient has been in close contact with any dog, or in any circumstance in which he could have contracted ticks. In both the cases we reported this had been the case, and on examination of the ticks with which the dog was infected, we found in them bodies which closely resembled, if they were not identical in species with, the bodies found in the urines. We had hoped to confirm the observation before writing of it, but under present circumstances can only offer it as an isolated fact of a suggestive nature.

Yours truly,
E. G. HAMILTON WILLIAMS,
MARY HAMILTON WILLIAMS.

Boreham Wood,
May 25, 1901.

TYPHOID FEVER IN UGANDA.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIR,—In the paper I sent for publication in your paper a fortnight ago, I said that I had not come across any cases of typhoid in Uganda, and the Government P.M.O. agreed with me. Curiously enough, in the last ten days we have done two *post mortems* on typical cases of typhoid. A smear from the spleen in the first case was crowded with Eberth's bacillus, and the second case was absolutely characteristic, with the usual ulcers, mesenteric glands, &c.

Sincerely yours,
ALBERT R. COOK.

Mengo, Uganda,
April 11, 1901.

Reviews.

THE DISEASES OF THE THYROID GLAND AND THEIR SURGICAL TREATMENT. By James Berry, B.S.Lond., F.R.C.S., Surgeon to the Royal Free Hospital, London. London: J. & A. Churchill. 1901. Pp. 367, with 121 illustrations. Price 14s.

That a portion of the human body weighing but one ounce should require a book of 367 pages to be devoted to its pathology and surgery is a proof of the advance of our knowledge of disease in general and of surgery in particular. Yet there is not a superfluous sentence in this carefully prepared work. The anatomy of the thyroid gland is concisely and clearly described in the first chapter of the work. To those unacquainted with recent anatomical advance the description of accessory thyroid glands and of parathyroids will prove to them that there is no standing still in even the anatomy of the human body; and if this be true of so an approximately exact science as anatomy, the fact of progress will be brought fully home to them in the perusal of the subsequent pages. Congenital affections, atrophy and hypertrophy are dealt with in Chapters II. and

III. Goitre and its varieties are described in Chapter IV. and beautifully illustrated; and the etiology and geographical distribution of endemic goitre in Chapter V. In connection with this subject Mr. Berry states that goitre has little to do with climate, want of sunshine, carrying weights on the head, heredity, or intermarriage. On the other hand, the author holds that endemic goitre bears some definite relation to a poison in the soil conveyed by drinking water derived usually from calcareous soils, but probably not a salt of lime or magnesia. An excellent clinical picture is given of the signs and symptoms of thyroid enlargements, and of the dyspnoea caused by goitre. Separate chapters are devoted to inflammation of the gland, to tubercle and syphilis, to cystic disease, hydatids, exophthalmic goitre, to malignant disease and their treatment. The last chapters of the book, XIV. to XXII., are devoted to accounts of the various methods of treatment, and the appendix is devoted to a tabulated summary of one hundred consecutive cases of removal of goitre by operation, performed by the author between February, 1894, and January, 1901. The results are at once highly creditable to the operator, and serve to establish the surgical treatment of diseases of the thyroid on a firm basis.

This book is a welcome addition to a hitherto greatly neglected branch of surgical literature; the appearance of the work is creditable to the publisher, and the author may rest assured that he has gained the approbation of his surgical colleagues by the thoroughly scientific spirit in which he has handled the subject of diseases of the thyroid gland.

News and Notes.

DIPHTHERIA AMONG CATS.

CHICAGO is reported to be having an epidemic of diphtheria among cats. The amount of infectious disease transmitted by domestic pets is probably far greater than people generally have any idea of, and cats are especially sources of danger, owing to their "freedom of the house," even including the sanctity of the bed chamber. The cat, moreover, is said to be very susceptible to diphtheria, and it devolves upon the members of the profession attending in cases of diphtheria to properly instruct those concerned to this effect.—*New York Med. Jour.*, May 18, 1901.

THE *Progrès Medical* of April 27 gives the following prescription by Dr. Bocquillon-Simonsin for local application in cases of lepra, psoriasis and lupus.

R. Gynocardic acid ...	...	...	12 grains.
Chaulmoogra oil ...	...	...	150 "
Vaseline ...	...	...	300 "
Paraffin ...	...	...	75 "

M. For local application.

THE OLEANDER LOUSE AS A TRANSMITTER OF MALARIA.—The part played by insects in the transmission of diseases is meeting with constantly growing consideration. M. Vicente (*Archives générales de médecine*, March; *Gazette hebdomadaire de médecine et de chirurgie*, April 28) thinks he has found a vehicle of malaria in the *Aspidiotus nerii*, a crustacean insect

that infests the oleander. A certain family included a person who for many years had been subject to frequent malarial attacks. Some oleanders were added to the ornaments of the house, and three children promptly showed signs of malarial disease. The hæmatozoön of malaria was found on the lice parasitic on the plants.—*New York Med. Jour.*, May 25, 1901.

Current Literature.

LEPROSY.

It is reported from Maryland that a case of leprosy was discovered there last week of more than two years' standing. The patient was formerly employed as a nurse, is married and has two children. The disease is of the mixed form.—*Journ. Amer. Med. Assoc.*, May 4, 1901.

LEPROSY ON THE CANARY ISLANDS.—The existence of about 200 lepers on the island of Teneriffe, Canary Islands, has been officially reported at Washington by United States Consul Berliner. He says that there are three distinct classes of leprosy on Teneriffe Island, namely, *lepra arabum*, *lepra elephantiasis*, and *lepra tuberculosis*. The disease diverges into two main varieties, the spotted and the nodular. The report is based on personal investigation and assistance of physicians, and says: "As being contagious, it is generally discredited here, but, in my opinion, it is very infectious. In former years Spain had established a colony at Grand Canary for lepers. They were housed there, but had perfect liberty to wander about with the restriction that they must sleep at the houses built for them. In course of time this law became a dead letter, and gradually they spread over the different islands. At Santa Cruz de Teneriffe, the capital, there are (from personal knowledge) twenty-two lepers, fifteen of whom are men, and there are also some children of these unfortunates. Officially it is not recognised that leprosy exists on these islands." United States Consular Agent Swanson, on Grand Canary Island, in an accompanying report, says that leprosy there is decidedly decreasing. There are fifty patients in the lepers' hospital at Las Palmas. A few families infected with the disease live in their own homes.—*New York Med. Journ.*, April 27, 1901. (See "Leprosy in the Canary Islands," by Dr. Stanford Harris, *JOURNAL OF TROPICAL MEDICINE*, October 15, 1898.)

LIVER.

HEPATIC ABSCESS: REMOVAL OF A RIB, RECOVERY.—B. J., admitted to hospital on May 5, 1900, suffering from vomiting and diarrhoea, but no fever. There was a doubtful history of dysentery at Singapore six months previously. The liver dulness was normal and the tenderness and pain (which were present

before his admittance) were gone. On May 16, his temperature rose to 100 degrees and kept up to between 100 and 101 degrees, when on aspiration pus was found in the liver. The abscess was opened in the usual way and a piece of the rib excised. The temperature fell in forty-eight hours to normal till June 1, when it again rose to 100 degrees, and on the 10th he had a very severe rigor with temperature 103 degrees. There was slight tenderness just below the ribs in the mid-axillary line. His temperature now kept rising to 105 and 104 degrees, and on the 13th six punctures failed to detect pus. His condition remained the same with furred tongue, vomiting, fever, and great loss of flesh and occasional rigors. Quinine, carbonic acid in large doses, and antistreptococcus serum were all tried without result. On July 19 the liver was again explored with negative results, but three ounces of clear serum were drawn off from the right pleural cavity. His condition getting worse he was again put under chloroform on July 22, when the whole of the ninth rib was found necrosed and was removed up to half an inch from the spine. His temperature still continued to rise in the evening to 100 and 101 degrees, but he slowly convalesced after a large abscess in the right thigh was opened. The patient's weight fell from 150 lbs. to 122 lbs. Patient was discharged on September 1. After a trip to Japan returned en route to England. His weight had improved, and this very large incision completely healed, though he still showed traces of the severe illness he had been through.—Dr. Bell, *Hong Kong Civil Hospital Report*, 1900.

MISCELLANEOUS.

YAWS AND SYPHILIS.—It is evident that Professor R. Koch does not coincide with Mr. Hutchinson in his opinion that yaws and syphilis are one and the same disease. As regards the former Dr. Koch says: "This disease is often met with in Kaiser Wilhelmsland (German New Guinea), the Caroline and Marianne Islands, and in the Bismarck Archipelago. In some of the villages, almost all the children are more or less affected. Every stage of the disease came under notice, from the initial lesion similar to small variola papules, to large confluences of smaller ulcerated nodules. These ulcerations were mostly situated on the lips, neck, genitals, and anus, as also in the axillæ. They may under certain circumstances resemble syphilitic condylomata, but the correct diagnosis of yaws is come to by the fact that children with healthy parents are almost exclusively affected."

As to syphilis Dr. Koch says: "In New Guinea the disease certainly exists amongst imported coolies, but not to a great extent. Its course and symptoms do not differ from those observed in Europe. *I did not meet with a solitary case in purely native villages.*"

DE LA NATURE DES FIEVRES HEMATURQUES DES PAYS CHAUDS. (The Character of Hæmaturic Fevers of the Tropics.)—Dr. Chas. Firket, after briefly

describing the symptoms of blackwater fever, gives as examples a few cases of this disease. He considers the fact that blackwater fever has a long period of incubation, *i.e.*, that it breaks out a long time after the patient's return to Europe, of primary importance from an etiological point of view. The author utterly repudiates the idea of its affinity with yellow fever. Most authors attribute blackwater fever to malaria, although it cannot be said to coincide with an attack of malaria, as evidenced by the examination of the blood, idiosyncrasy against quinine, &c. The author is, however, of the opinion that though the fever is not actually malaria, yet a previous attack of malaria must have caused its development; in short, in his words blackwater fever is "un accident parapoludéen." The author is also of opinion that various injurious influences to which the European constitution is subjected in the tropics, such as chills, excesses, fatigue, or wet, in connection with malaria, prepare the way for blackwater fever. The better the hygienic conditions the rarer the disease. Dr. Firket does not consider hæmoglobinuria a specific disease, and, except in quite exceptional cases, denies the statement that quinine is capable of starting the complaint.—*Bul. de l'Acad. Roy. de Med. de Belgique*, 1900.

Giornale Medico del R. Esercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
Public Health.
Revista de Medicina Tropical.
Revista Medica de S. Paulo.
The Hospital.
The Medical and Surgical Review of Reviews.
The Northumberland and Durham Medical Journal.
Treatment.

Letters, Communications, &c., have been received from:—

B.—Dr. F. Burge (Shanghai); Dr. Osborne Browne (Edinburgh); Dr. Oswald Baker (London).
C.—Dr. Albert Cook (Uganda); Dr. A. J. M. Closky (Lelangor); Mr. John Cretin (Bristol); Dr. J. Cropper (London); Dr. J. Howard Cook; C.M.S (Uganda).
D.—Dr. C. W. Daniels (London).
G.—Dr. Graham (Sumatra); Dr. John Gimlette (Pahang).
M.—Dr. Preston Maxwell (Changpoo); Miss E. L. Mitcheson L.R.C.P. & S. (Minzenberg).
N.—Mr. C. Nicholson (Cape Town).
O.—Dr. Ozzard (British Guiana).
P.—Fleet-Surg. J. Porter, R.N. (Haslar).
R.—Dr. W. Renner (Sierra Leone).
S.—Dr. Surendra Nath Sirkar (Sangor); Dr. W. Loudon Strain (Sao Paulo).
W.—Drs. E. G. and M. Hamilton Williams (Boreham Wood).

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
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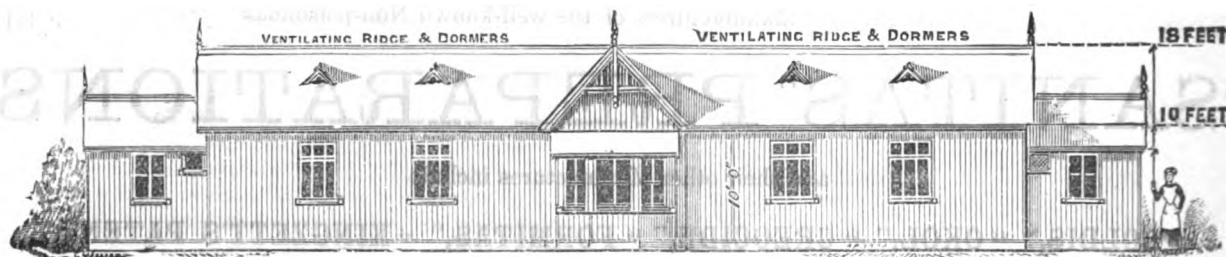
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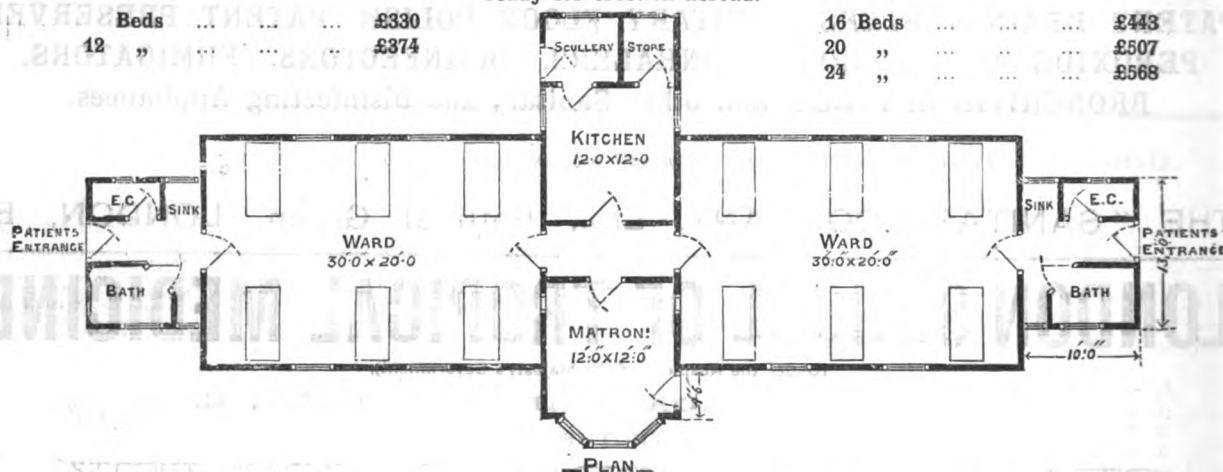


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BIHYDROCHLORATE	72.0 %	" 1 "	1.02
HYDROBROMATE	76.6 %	" 45 "	.98
*BIHYDROBROMATE	60.0 %	" 7 "	1.23
BISULPHATE	59.1 %	" 11 "	1.24
PHOSPHATE	72.8 %	" 78 "	1.01
VALERIANATE	75.7 %	" 110 "	.97
*LACTATE	78.2 %	" 10 "	.94
SALICYLATE	70.1 %	" 225 "	1.05
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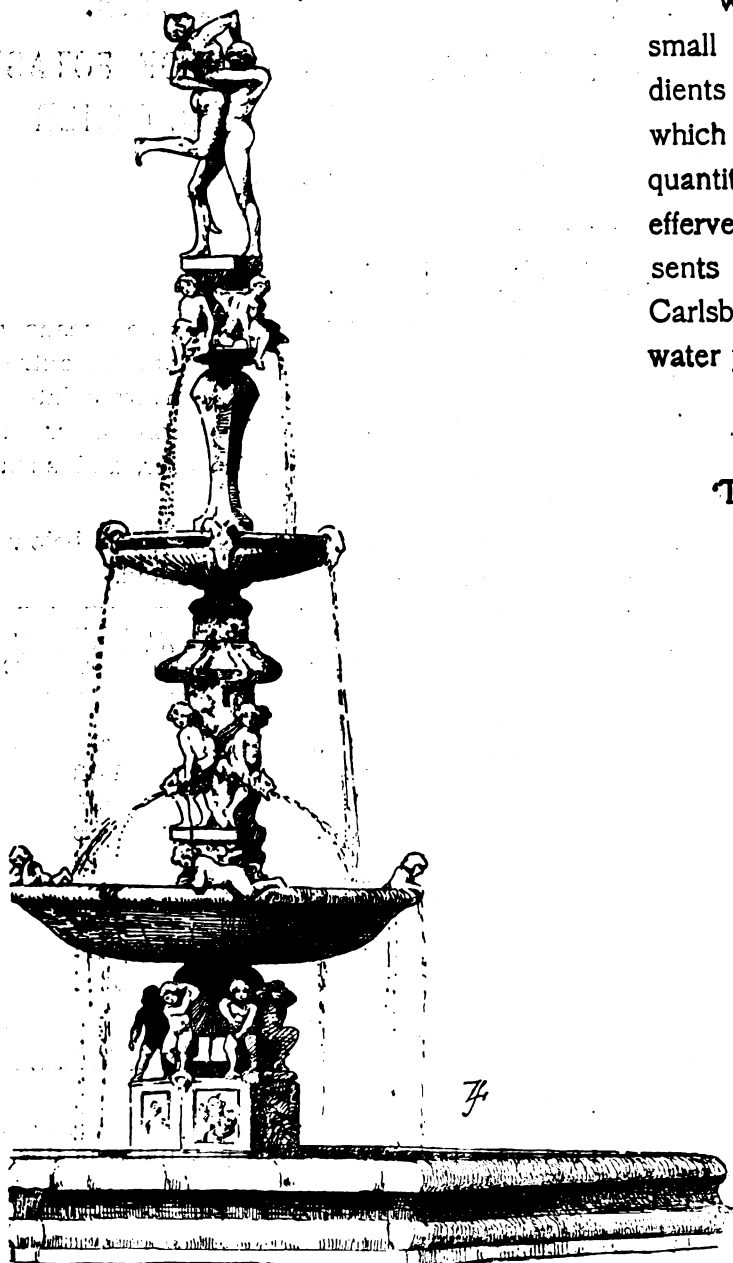
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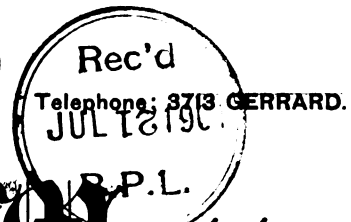
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THE
Journal of Tropical Medicine

A FORTNIGHTLY JOURNAL DEVOTED TO MEDICAL, SURGICAL AND
GYNÆCOLOGICAL WORK IN THE TROPICS.

EDITED BY JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D., F.R.C.P.

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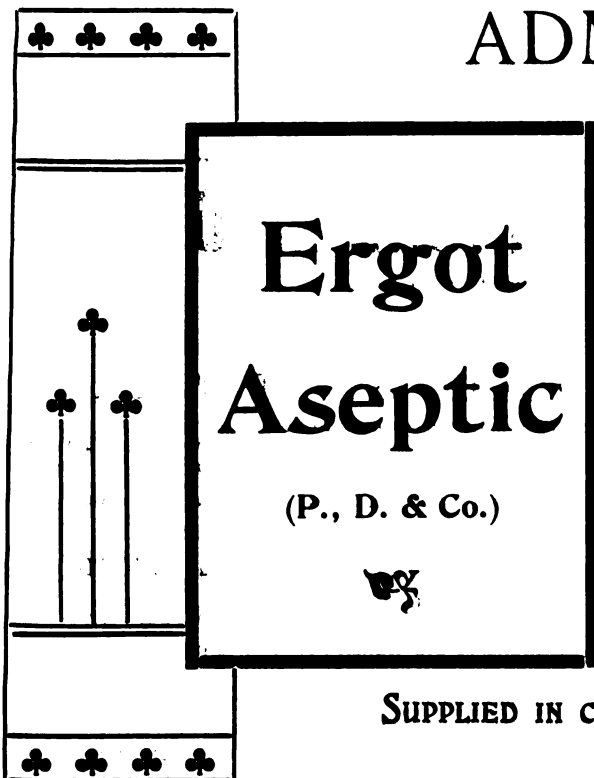
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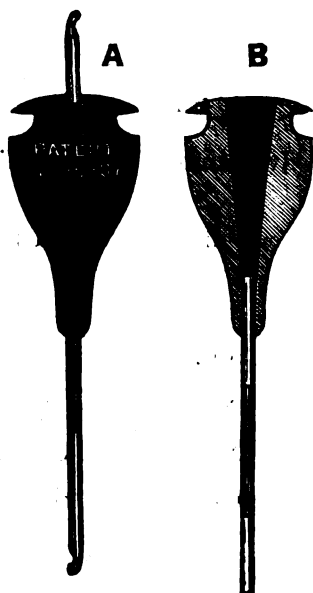
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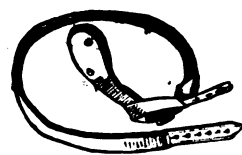
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The Journal of Tropical Medicine.

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Original Communications.

ON HÆMORRHAGIC BULLA OF THE MOUTH AND PHARYNX.

By J. PRESTON MAXWELL, M.B., F.R.C.S.
Changpo, Fokien Province, China.

IN the whole of this region of South China (Fokien), there exists a curious, startling, and at the same time, hitherto, as far as I know, unnoted, affection. I refer to the disease to which I have given the above name.

Its *ætiology* is as follows:—It may occur in children and old people, but I have never heard of it in infants, and the majority of the cases are in the prime of life. It is a very common affection, about one-fifth of the adult population in my own region having either seen it or experienced it. It occurs at all times of the year, and is not absolutely bound up with any special act of the patient; but about 95 per cent. of the cases occur during the act of eating food.

The clinical picture of the affection will be sufficiently shown if I narrate two cases.

The first is that of a woman of 40, in a good position of life. While eating rice she suddenly felt a stinging pain in her mouth and became aware of a swelling on the roof of the mouth. She at once came to the hospital. In the middle line, at the junction of the hard and soft palate, and extending partially over both, was a large tense hæmorrhagic bulla, covering an area of the size of a 2s. piece. It resisted attempts to burst it, and was finally left alone, breaking of its own accord an hour or two later, and leaving an eroded surface from which dark blood oozed. This was easily arrested by a tannic acid gargle and a dose of ergot, and in a day or two the patient was well.

The other case was a man of 60. In him the bulla was situated on the inside of the right cheek, was slightly smaller than the preceding one, and had already burst. When he came to me he was run-

ning blood from his mouth, the blood being arterial in colour. The same treatment speedily arrested the hæmorrhage, but the patient was very frightened. It had come on while he was eating his rice.

The swelling never, as far as I can learn, takes place on the inner surface of the lips, but the roof of the mouth, the palate and uvula, insides of the cheeks, and pharynx, all have within my knowledge been affected. There is also a form of hæmorrhage from the stomach unattended by symptoms of the classical stomach affections, which may be due to some poison of this kind. I have only seen one case which occurred in a patient in perfect health, and apparently did his health no injury. All the cases I have hitherto seen have been Chinese. The blood bulla is always prune juice in colour, and generally the blood which oozes from the burst bulla is also dark. The patient is generally much alarmed, and on one occasion in my experience nearly fainted from the mental shock.

The *pathology* of the affection is obscure, and so far I have been unable to trace it. I have known it come on (a) while eating rice and small fish; (b) while eating candied sugar; (c) while drinking tea; (d) while eating soft biscuits; (e) while playing about. In the latter case the boy was positive some insect had bitten him, having entered while his mouth was open. His blister was on the soft palate at the base of the uvula, and was not a large one but bled freely.

The Chinese universally attribute the disease to the web of a peculiar fly-catching spider. This insect spins an insignificant web and catches its prey by springing on it. In several instances my patients have seen the spider jump out from their basin of condiments, and taking a piece from that place have been immediately victimised. But unfortunately all my efforts to artificially reproduce the condition in animals and man have been a complete failure. There are the black and the brown varieties of this spider. I have kept both, procured their web spun on sugar and in an empty box, and rubbed it on the

inner surface of the cheek without any appreciable result.

It is not due to the scratching of the surface by a bone or other article in the food. I have never been able to find the site of puncture, and it may supervene on a cup of tea or entirely soft fare.

The affection itself is undoubtedly a hæmorrhage into the deeper layers of the epithelium of the mucous membrane.

The *prognosis* is very good. I have never seen a serious case, but know of one or two where the swelling occurred far down in the pharynx and rendered breathing difficult and swallowing impossible till the swelling was broken. Occasionally the site may obstinately ooze for some hours, but it always finally spontaneously ceases. What would happen in a hæmophilic I don't know, and I have not been unfortunate enough to meet one yet.

The *treatment* is simple. A tannic acid gargle stops the bleeding quickly. Sometimes I give a dose of ergot which appears to help. The patient is forbidden to eat hard food till the mouth is well, and if the erosion is very painful a mouth wash is prescribed as occasion requires.

Appended is a list of a few cases the first nine of which were all seen by myself.

		Age			Size approx.
1	G. N.	40	Eating rice	Hard and soft palate	2s. piece.
2	C. T.	21	Eating rice	Cheek	2s. "
3	C.	23	Eating rice	Cheek	1s. "
4	H.	16	Playing about	Junction of palate and uvula	6d. "
5	K.	13	Eating candied sugar	Junction of palate and cheek, anterior pillar	2s. "
6	S.	60	Eating rice	Cheek	2s. 6d. "
7	Ch.	24	Eating soft biscuit	Cheek	1s. "
8	J. B.	20	Drinking tea	Cheek	6d. "
9	B. T.	35	Eating rice	Palate	2s. "
10	H.	30	Eating rice	Deep down in pharynx	(?) "
11	C. K.	21	Eating rice	Cheek	1s. "
12	K. S.	28	Eating candied sugar	Palate	2s. "
13	H. T.	36	Eating rice	Cheek	2s. "

PRICKLY HEAT.

By FREDERICK PEARSE, F.R.C.S.Eng.
Calcutta.

In a former communication to you on the above subject I fear that I must have expressed myself very clumsily, as several of your correspondents have misunderstood me. I look upon the rash of prickly heat as an acute seborrhœa. It is identical in character with the rash commonly seen "at home," and called a form of seborrhœa, which occurs in some persons, especially if they wear flannel, and which is usually caused by continued perspiration of slight degree with infrequently changed underclothes. An irritating secretion, made up of all forms of exudation from the skin undergoing decom-

position and crowded with germs, is doubtless the direct cause of this so-called seborrhœa, and of the so-called "flannel" rash with which I hold it to be identical. Prickly heat is exactly the same sort of thing, but modified by the conditions which excite it. Intertrigo, however, is quite a different disease, although excited by irritating secretions. The term seborrhœa is of course a bad one, because the disease is not merely an increased discharge of sebum. There is an increased sebaceous secretion, but with the seborrhœa of home and the "flannel rash" and prickly heat, there are other conditions. I quite agree with Major Moore that prickly heat is an irritation of the skin produced by the constant bath of perspiration, so far as that description carries. It never occurs without free and long continued perspiration, although many persons who sweat profusely never suffer from it. My contention is that the disease is dependent upon the disturbed function of the sebaceous glands. It only occurs where these glands exist, and it occurs most frequently where these glands are not usually called upon for much work. The parts of the body covered with fine downy hairs are chiefly affected—not those parts provided with coarse hairs. Certain individuals are more subject to it than others. I should say that rheumatic and gouty constitutions were pre-eminently liable to it. Old residents in the tropics seldom suffer to the extent that comparatively new comers do. Athletic exercises and training in England do not excite the so-called seborrhœa unless associated with dirty habits, and I have not found that active exercise in India intensifies prickly heat. Probably the custom of frequent bathing, which removes irritating secretions, may be the explanation of this. At any rate the sedentary are equally the subjects of it as the active, if not more frequently so. It is not necessarily associated with clothing (because it is very common on the backs of the hands and the face), although I admit that clothing, especially flannel, is very liable to determine it. It is not surprising that anything which excites the blood to the skin and induces perspiration should accentuate the symptoms of prickly heat, even on the basis of its seborrhœic character. Does not the warmth of bed excite itching in scabies, in which neither the sweat glands nor the sebaceous glands are affected? To attribute to me the opinion that soap can produce an acute seborrhœa is hardly fair. I do consider that soap is injurious to the skin by removing its natural grease, and that its use is especially to be deprecated in the tropics where perspiration is particularly free, but that is quite a different matter to saying soap can produce an acute seborrhœa. In the heated atmosphere of the tropics, and under the influence of excessive and long continued perspiration, the sebaceous glands are called upon for more work. A greasy skin may be more liable to comedones and acne spots, but it will not be so liable to sudamina.

I am very satisfied to find that my recommendation for oiling the skin has proved successful. Major Moore and I are practically at one so far as treatment is concerned. He prefers cocoa-nut oil—I prefer lanoline in almond oil. I find the addition

of menthol to the mixture relieves the intense irritation most satisfactorily. The explanation of the disease must necessarily remain a matter of opinion. I still think that prickly heat is a form of acute seborrhœa. Whether any bacterial or fungous growth is the proximate cause I have not been able to determine. There are many reasons why we should expect this, especially the fact that profuse and even prolonged perspiration is alone not sufficient to produce it.

GOUNDOU PRECEDING CHRONIC HYDRO-CEPHALUS IN A MALAY CHILD.

By LIM BOON KENG, M.B., C.M.Edin.
Singapore.

Two years ago a Malay child, aged 6 months, was brought into my consulting room. It had all the appearance of goundou as seen in some negroes.



The mother informed me that the child had had a fall, and that she thought the swellings on each side of the bridge of the nose were due to the blow which the head of the child received. Of course, I recognised that the growth was practically congenital and had slowly developed. At that time there was no sign of any other abnormality in the head of the child or elsewhere.

The swellings were carefully manipulated. They were symmetrical, and presented to the touch a resilient and elastic resistance. Beneath the skin we had practically the growth of bone tissue, with large cavities which possessed very thin walls. The growth must have proceeded from the ethmoid or frontal cells through ununited sutures between the nasal, premaxillary, and frontal bones. The subsequent history of the case confirmed this view of the origin of the swellings. Moreover, the most prominent parts of the goundou masses, were quite

soft, and here we could detect a slight pulsation which moved synchronously with the fontanelles. I came to the conclusion that the bone cavities contained prolongations of the cerebral meninges, and that the pulsation took place through the intervention of the cerebro-spinal fluid. I asked the mother to have the child photographed, and that if it got worse to bring it back with the photograph for comparison. The first portrait shows the goundou swellings rather indistinctly as the photograph had faded considerably, but the second picture gives an excellent representation of the goundou enlargements.

A few months ago the unfortunate patient was brought back to my office. During the year the head had steadily enlarged through the development of chronic hydrocephalus. All the great sutures were quite ununited with the exception of the lambdoidal. Some parts of the skin had grown in



thickness and there ossification had been complete. The right side of the skull was one mass of bone extending from the right parietal eminence down to the temporal and to the mastoid regions, while the left squamous portion of the temporal was entirely unossified. As usual in cases of chronic hydrocephalus, the superficial veins were visible.

The case, I believe, is quite a unique one, for goundou is hitherto known only among negroes or other races of Africa in whom the nasal bones are least prominent. The nature of goundou has been guessed at by various observers. The least satisfactory hypothesis is the parasitic theory of its origin. But the condition of the swellings and their relation to the hydrocephalus would incline me to regard this peculiar disease as a malformation with consequent non-union of the suture between the nasal and frontal bones.

The swellings were undoubtedly caused by a growth of cellular bone of the nature of the ethmoid bone. The cavities of the cells were filled with

prolongations of the meninges and were thus in communication with the cranial cavity. This fact alone could account for the pulsatile movements already mentioned. The thin bony structure resembled the *membrana papyracea* of the ethmoid. The growth must have come either from the ethmoid or from the cellular portion of the frontal where the sinuses are found.

The condition of the eyes was due to the disproportion between the eyelids and the orbital cavity. Through exposure the cornea were destroyed by inflammation. Death resulted from the effects of hydrocephalus. No *post-mortem* examination was permitted.

I have described the above case as "goundou" because I do not know with what else to compare it. I believe, however, that my case gives us a clue to the real pathology of goundou.

the present case presents itself is as nearly as possible 24° 18' north lat., and 91° 50' east long., and in a straight line is at least 200 miles from the nearest sea-shore.

The patient is a Mussulman, aged 27, a native of the district; he has never been far from home, and lives like his neighbours on meat, rice, fish, peas, and the like. He is married, but has no family. His brothers, and other near relatives, to the number of nearly twenty, men, women, and children, all live nearly in contiguous houses; they use the same drinking water and the same rice, and live otherwise exactly as he does, but he has fallen a victim to beri-beri while the others have not.

History of Illness.—About a year ago he suffered from "pains in the back," for which he used a liniment. This relieved him, but he thinks that he was weaker than usual afterwards. The present illness appears to have begun definitely about two months ago with pain and swelling of the legs and feet, followed by numbness and loss of power and

A SPORADIC CASE OF BERI-BERI WITH BLOOD IN THE URINE.

By A. B. DALGETTY, C.M., M.D.

South Sylhet, India.

CASES of beri-beri are not common in India outside an endemic area, which is confined to a strip of coast in the Presidency of Madras. Hirsch says that cases have been recorded from Dacca and Assam, but these date back to 1880, and no recent cases appear to have been reported from these districts. Since all information bearing upon this obscure malady must be welcome, I venture to publish the following case, which seems to be a genuine and isolated example of the disease in question. Formerly, it was believed that beri-beri was restricted to coast-towns and to low-lying strips of territory bordering on the sea, but this limited area of distribution has had to be greatly extended since cases have been reported from places hundreds of miles from the sea, and from places at considerable altitudes.

The location of the spot in South Sylhet in which

difficulty in walking. These symptoms have progressively increased up to the present time, when it is as much as he can do to get about slowly with the help of a stick.

Present Condition.—He is a tall, well-built, intelligent young man, not at all anæmic; he walks with the high-stepping gait characteristic of weakness of the anterior tibial muscles; he has difficulty in rising up from a sitting posture and squats down hurriedly.

Circulatory System.—The heart on first examination was rapid and tumultuous, apex heaving and systolic murmurs were heard over the aortic and pulmonary areas, but these had disappeared before the examination was finished. There was no cardiac dilatation so far as I could discover. The pulse was rapid, short, full and compressible, but regular in rhythm. He complained of palpitation and breathlessness on slight exertion.

Respiratory System showed nothing abnormal.

Digestive System.—Appetite fair, has sometimes feeling of nausea but does not vomit, has occasionally pain over epigastrium, bowels constipated, had no diarrhoea in the early stages of illness as is said sometimes to happen (Manson). Liver and spleen were normal.

Urinary System.—Has no difficulty in passing water. Urine amber-brown, slight flocculent deposit, acid, sp. gr. 1020, no albumin, no sugar; under microscope showed crystals of oxalate and phosphate of lime, and a cluster of epithelium apparently of the type found in the tubules of the kidney. (For condition of urine later, see end of article.)

Blood showed nothing abnormal. Xanthocytes well coloured, contour, size and shape natural, no excess of leucocytes.

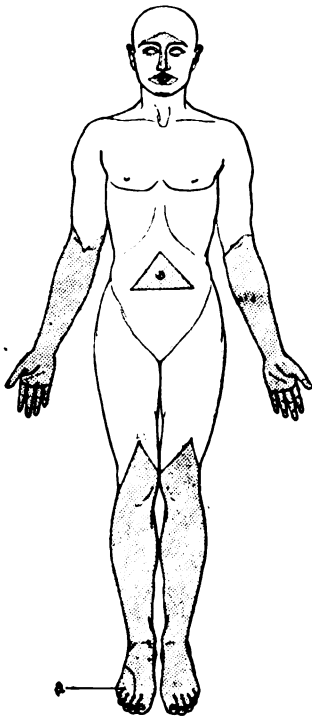


FIG. 1.—ANÆSTHETIC AREAS, FRONT VIEW.

Temperature, morning and evening, normal. Whether there had been fever during the earlier stages of the illness could not be correctly determined.

Integumentary and Muscular Systems.—There has been no skin eruption at any time. There is œdema of both feet, extending up the front of the legs to below the knee, but it is not excessive, though it pits distinctly under pressure. There is no œdema of the thighs or arms and no ascites, but there is distinct fullness of the skin in the umbilical region, and puffiness of the face especially about the eyes. *Anæsthesia* is considerable or complete over the most part of the surface of the legs below the knee, and runs upwards on the front of the thighs for a distance of one-third their length; but an area over the back and outer side of both feet is much less affected, while two oval patches occupying both calves show little or no diminution in sensibility (figs. 1 and 2, a,a and b,b).

There is also a triangular patch of anæsthetic skin around the umbilicus, from four inches below to three inches above it, with a base of six inches. Both hands and forearms as far up as the elbows are more or less anæsthetic; the back of the fingers are less dull than the front. Diminished sensibility occurs also round both lips, over the bridge of the nose, above both supra-orbital regions and upwards on to the forehead (fig. 1). This peculiar distribution on the face is not commonly seen, I think. Over the spine in the lower dorsal region there is slight tenderness on pressure, which runs round both sides for some distance, but sensation appears to be normal all over the back.

Sensibility to cold and heat is normal but much diminished in acuteness. The numbness of the

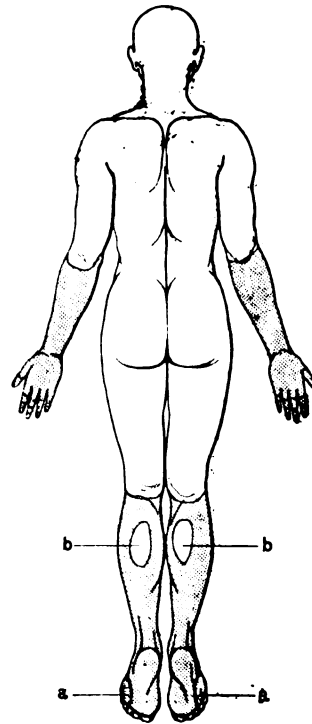


FIG. 2.—ANÆSTHETIC AREAS, BACK VIEW.

fingers is very marked, and pricking sensations occur in the hands and arms. The calf-muscles are very tender to pressure, and pressure over the course of the large nerves also elicits pain. Cramps occur, especially in the muscles of the calf. The patellar reflex is absent; ankle clonus is not produced. There is a good deal of wasting and softness of the muscles of the hands and forearms, but the muscles of the calf are rather hard than otherwise. The special senses are not affected, but the voice is unsteady at times.

The following is the cutaneous nerve supply of the anæsthetic areas:—*On the leg*, in front, the parts supplied by branches of the anterior tibial, external popliteal, and internal saphenous nerves are all affected; but those parts supplied by the musculocutaneous, viz., the outer three-and-a-half toes, and by the external saphenous (a,a), are much less so; behind, the area of distribution of the external saphenous nerve is practically unaffected. *Above*

the knee the anæsthetic area corresponds to the terminations of the external, middle, and internal cutaneous nerves. *Umbilical area* is supplied by the anterior cutaneous branches of the last four intercostal nerves. It is noteworthy that neither the lateral cutaneous branches nor the posterior divisions of these intercostal nerves are affected. This would seem to show that the particular nerves are attacked only at the periphery. On the face the anæsthetic spots are supplied by branches of the inferior maxillary, superior maxillary, nasal and supra-orbital and supra-trochlear branches of the ophthalmic.

The above would appear to be a genuine case of beri-beri. It was seen by several other medical practitioners, and all agreed in the diagnosis. It is a remarkable thing that a single isolated case of this disease should suddenly spring up in an inland, non-endemic spot. So far it is the only case. Whatever the cause of beri-beri may be, the old theories of water and food must be abandoned. Here is a man living in daily contact with a number of other people, eating the same food, drinking the same water, sleeping on the same ground, and otherwise behaving exactly as they do, yet he and he alone develops beri-beri.

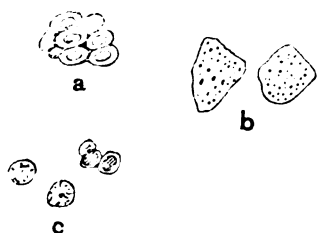


FIG. 3.—BODIES FOUND IN URINE.

Nowadays to ascribe the cause of any disease to food or water, to soil or climate, is only to confess our ignorance of that cause. These *per se* can give rise to no disease.

It would seem that the poison affects not only the peripheral nerves, but also causes a vaso-motor paralysis, hence the œdema of the anæsthetic areas.

Three months later.—During the past three months the patient has been slowly improving under malt, cod-liver oil, strychnine, digitalis, quinine, bitters, and such like. He has not changed his habits in any way, nor was it feasible for him to change his residence, although advised to do so.

Sensation has returned over all the dull areas; the hands have recovered their power, but the muscles of the legs are still weak so that the feet have to be lifted unnaturally high. The chief complaint now is pain and *hardness* of the calf-muscles. The patellar reflex is still absent, and the heart is yet too easily excited. But the most interesting point now is the state of the urine. It now contains a trace of albumin and considerable numbers of xanthocytes as well as different forms of epithelium (fig. 3). Manson says that albumin may be found, but that it is only occasional and accidental.

In the latest accounts of this disease, those published by Dr. Gibson in recent numbers of this Journal, little mention is made of the condition of

the urine. But it might be worth while for those who have numbers of cases, easily got at, to take more frequent and more careful note of the urine, for albumin may be more common than is supposed.

At the first trial I missed the albumin, and it was only after finding the altered blood corpuscles with the microscope, that I returned to the test and found a distinct trace of albumin. No complication has arisen so far as I can see which would account for this. The albuminuria may be intermittent, and thus may not be found at any given time.

The man is not a regular patient of mine, and I see him only at considerable intervals, hence the fewness of the observations.

MOSQUITO DESTRUCTION.—The United States Department of Agriculture has issued a circular written by Mr. L. O. Howard on the habits and methods of destruction of mosquitoes. Even in houses screened against mosquitoes these pests may find access, and when they do Mr. Howard recommends: (1) The slow burning of cones made of moistened pyrethrum powder; this, however, is only a palliative and wards off mosquitoes without destroying them; (2) mosquitoes on the ceiling of a bedroom may be easily killed by placing under them a shallow tin vessel nailed to the end of a stick and moistened in the inside with kerosene; (3) destruction of larvæ in breeding pools; (4) draining ponds and marshes; (5) stocking the breeding ponds with fish, are all mentioned as efficient means of ridding a house or neighbourhood of mosquitoes. (6) Kerosene in the proportion of, say, 1 ounce of oil to 15 square feet of water surface is deemed sufficient to effectually destroy mosquito larvæ; the application being renewed once a month. Cess-pools, cisterns, water in water-barrels, &c., may be rendered innocuous by kerosene; and if the drinking water is drawn off from the bottom of the vessel or tank, the kerosene does not affect the taste or composition of the water. Extensive marshes present great difficulty in treatment by any application except by drainage; a procedure which in many places proves too expensive to be undertaken.

THE MOSQUITO LAMP.—Of all means of destroying mosquitoes which have gained access within the mosquito netting around a bed, the mosquito lamp, known locally in China as the "Swatow Mosquito Lamp," is the best. To travellers this lamp is invaluable. As yet mosquito-protected houses are practically non-existent, and it will be many years before they become general even in settled localities; but travellers in cities away from European settlements will always have to contend against these pests, even although they carry mosquito nets in their baggage wherewith to protect their beds. Once the insects get within the curtains expulsion is well nigh impossible, and loss of sleep and danger of infection are sure to follow. By the Swatow lamp a sure, safe, and ready method of getting rid of mosquitoes inside bed curtains is available. The Swatow lamp can be procured from Mr. J. H. Montague, Surgical Instrument Maker, 101, New Bond Street, London.

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THE

Journal of Tropical Medicine

JULY 1, 1901.

GRASSI AND HIS CONTEMPORARIES.

CONSIDERABLE discussion, attended by not a little acrimony, has arisen lately concerning Professor Grassi of Rome, and several of his fellow-workers in the field of malarial pathology. We lament this *contretemps*, but we are by no means inclined to take sides in the matter. The scientific world so justly appreciates the work done of late years in the elucidation of the malarial problem, that it is a matter for regret that the great men, whose names will be for ever associated with the subject, should appear in any light but the most favourable. We have read of late an attack on Professor Grassi by his former co-worker Professor Calandruccio, and we have very reluctantly thought it our duty to publish a translation of Calandruccio's letter on the subject. That we support the statements made in the letter, from

the fact of its appearance in our columns, does not follow by any means, nor do we express an opinion for or against either the accuser or the accused.

Grassi's name must go down through all time as one of the foremost workers in the elucidation of the malarial problem and as one of the most earnest and most accomplished zoologists of his day. No one can come in contact with Grassi without at once recognising him as an enthusiast in science, as an original observer of the highest order, and as a man endowed with a capability of work for work's sake perhaps without an equal in his generation. In his small laboratory in Rome, which affords but a humble housing for this giant in research, which is but ill-equipped as modern laboratories go, Grassi has produced work which will lend imperishing fame to his name. His fellow workers—we will not say his enemies, for we are sure his devotion to science secures him against that—say that he has on occasion laid claim to original thoughts which have occurred to other men first, and who see fit to stand up for their own. This appears to us to be what the "storm" resolves itself into: but we find ourselves incapable of waxing wroth on the matter. We do not pretend to judge between the parties in the strife, and we would wish, were it in our power, to allay the irritation which seems to have been caused. The men whose names adorn our modern annals of tropical pathology were, we hoped, above the weaknesses and prejudices of lesser lights, and we would wish to consider them so. Commencing with the Frenchman Laveran we hold in the highest esteem the names of Grassi, Bignami, Bastianella, Celli, and Marchiafava amongst Italian scientists, of the names of Manson and Ross amongst British workers, and of MacCallum amongst Americans. These men will for ever be regarded as the pioneers in the fight against malaria, and we would desire to emblazon their names and their fame on "clean" escutcheons, so that posterity may honour where honour is due without the din of an acrimonious discussion in any way tarnishing the lustre.

THE LIVINGSTONE COLLEGE.

AN interesting ceremony took place at Knott's Green, Leyton, on Thursday, May 23, when the formal opening of the College was fittingly performed by Mrs. Bruce, Dr. David Livingstone's elder daughter.

The Principal, Dr. Harford-Battersby, in his address stated that the College was opened in 1893 by a small body of medical men who were interested in providing elementary training in medicine and surgery for missionaries. At first the College was situated in Bow Road, but it soon outgrew its surroundings, and was subsequently located in Stratford, London. This again proving inadequate, the present beautifully situated house was secured and fitted as a College.

It may be well at once to state that the course of study provided at Livingstone College in no sense entitles those who have passed through its course of study to style themselves "medical missionaries," or to assume the position of a qualified medical man. This is a point which we are sure the authorities of Livingstone College rightly insist upon, and it is one which, we rest assured, that the earnest men who avail themselves of the benefits of the College will never wish to traduce.

THE LIVINGSTONE EXHIBITION.

IN the Westminster Town Hall, on June 17, 18, 19, 20 and 21, what was termed the Livingstone Exhibition was open to the public. The exhibits were interesting to a degree, and still more attractive was the series of lectures delivered during the several days the exhibition was open.

The Principal of Livingstone College, Dr. Harford-Battersby, gave four lectures on the "Preservation of Health in Tropical Climates." On June 18, the subject of the lecture was "Clothing in the Tropics," in which the lecturer dealt theoretically and practically with the clothing of Europeans in warm climates. On June 19, "Food in the Tropics" was ably discussed. On June 20, the important subject of "Water in the Tropics" allowed the lecturer an ample field, more especially as regards the relation of water to diseases and the purification of water. The "Prevention of Malaria" was discussed on June 21, when the modern views of malarial infection were stated, and practical lessons deduced therefrom. Dr. Harford-Battersby is a capable lecturer and an excellent teacher, and we are confident that the instruction he gave will prove of infinite value to all tropical residents, and especially to those about to take up residence in the tropics. A number of interesting social functions distinguished the exhibition, and in addition to the lectures mentioned, several discussions were opened by well-known experts. Of these the discussion on "Acclimatisation," by Dr. L. W. Sambon, when Dr. Manson, C.M.G., F.R.S., took the Chair, was especially good. Lectures by Dr. F. W. Willway on "Health Precautions in Cold Climates," by Dr. Robert Howard on "Some Hints on Nursing Malaria," and by Dr. Sambon on "Life in a Malaria-

Proof Hut," were highly appreciated by attentive audiences.

We hope the exhibition proved the financial success it deserved to be, and we congratulate Dr. Harford-Battersby, who originated and organised the scheme, upon the excellence of the programme and upon the smooth working of the exhibition.

THE MALARIA EXPEDITION TO THE WEST COAST OF AFRICA SENT OUT FROM LIVERPOOL.

(Communicated).

THE Liverpool School of Tropical Medicine, which has become to a large extent identified with the efforts which have been so successfully made in recent years to trace the source of malarial infection, has now embarked on a wider undertaking, namely, the endeavour to clear a given district of malaria. Since the School was founded expeditions have been despatched every year to the fever-haunted West Coast of Africa under the direction of Major Ross, F.R.S., and the observations which have there been made have amply confirmed the Manson-Ross theory as to the connection between malaria and the *Anopheles* mosquito, and have also perfected our knowledge of the life history of the malarial parasite, and of the way in which it gains admittance to the human organism. Our knowledge of the subject may now be said to be pretty nearly complete, and may be briefly summed up as follows:—The parasite has two stages of existence, one is passed in the body of the mosquito, and the other in the body of man. The form which is present in the blood of malarial subjects undergoes a sexual propagation in the body of its host. Some of these organisms are withdrawn by the mosquito, enter the stomach of the insect, and there undergo sexual development, with the result that after passing through the stomach walls they form spores in the body cavity. These spores find their way to the poison gland of the mosquito and are introduced into the body of the next person it bites.

The mosquito is thus seen to be the carrier of the infection from one individual to another, and if there were no mosquitoes fresh cases of malaria would cease to appear. The *Anopheles* mosquito, the only kind which conveys the parasite of human malaria, has certain well-marked characteristics which enable it to be easily recognised, and its larval forms are found in puddles which are few in number and occur only in certain well recognised situations; and the winged insect does not fly far from the pool where it was hatched. These circumstances have led Major Ross to entertain the hope that, given a free hand and a fair number of intelligent assistants, it might be found possible to rid a given town or district of the *Anopheles*, and consequently to abolish malaria from it.

A Generous Donor.

The chief obstacle in the way of putting this theory to the test of experiment has been the expense which it would involve; but this year a gentleman in Scotland who desires his name to be

withheld from publication, has generously guaranteed the expense of exterminating the *Anopheles* from a given district in West Africa for a period of twelve months.

The Town of Sierra Leone

is the place which has been chosen for carrying out this great experiment, and the expedition, which includes Major Ross and Dr. Logan Taylor, lately Assistant Lecturer in Pathology in the University of Glasgow, sailed from the Mersey on June 15, on Messrs. Elder, Dempster & Co.'s steamer *Azim*. Forty assistants will be employed in carrying out the work of the expedition, which will consist in destroying mosquitoes and their larvæ wherever they can be found, filling up or draining pools and puddles, or where this cannot be done pouring on kerosine or some other oily body which will form a thin scum on the water.

By these measures and others of a like kind it is expected that the *Anopheles* will be largely destroyed throughout the town of Sierra Leone, and that its opportunities of breeding will be very materially curtailed if not entirely abolished. If at the end of twelve months the measures which have been taken to destroy the mosquito are successful and the frequency of malaria is materially reduced, it is expected that the local authorities will undertake the work in the future, and that it will be extended to neighbouring settlements. Major Ross will arrive during the rainy season, and consequently for some time the work will be carried on indoors, and will consist in killing the mosquitoes in houses. Major Ross hopes to be able to return to England in six months, but Dr. Taylor intends to stay out a year and see the year's work to an end.

The departure of Major Ross and Dr. Taylor was witnessed by a large and influential gathering of merchants and shipowners, and of representatives of the Liverpool University College, who met on the landing-stage to give the expedition a hearty send off. A message was also received from the Colonial Secretary wishing the expedition success, and stating that he had instructed the Governor of Sierra Leone and other Government officials, to give it all the assistance in their power. Mr. A. L. Jones, the Founder and Chairman of the Tropical School, went on board the *Azim* and spoke a few words of congratulation to Major Ross and Dr. Taylor. He said it was fitting that those present should extend the best of wishes to their friends who were about to proceed on an expedition in the interests of science and humanity. It was greatly to their credit that they had volunteered to take this perilous voyage. He was glad to say a few words on behalf of the Liverpool merchants and shipowners. The Tropical School had done good work in many ways already, and from the fact that the mosquito theory had received the support of Lord Lister one could hardly doubt that it would be ultimately successful in protecting people from the dangers of tropical climates. He assured Major Ross that if anything were wanted in the way of funds, Liverpool people would find it.

Major Ross, in responding, said that they were greatly indebted to Mr. Jones for what he had done

in connection with the work in question. It was he who had started it, and he had not only supported it in various ways, but had shown an active interest in it. Had it not been for Mr. Jones's wonderful instinct for bringing things to a success, and for his wonderful knowledge of men and affairs of all kinds, the School would never have been able to reach this point. He had not only given money to the work, but had secured honour for the professional members of the School on every possible occasion. When the undertaking had been brought to a successful issue, the whole country would see the magnitude and benefits of Mr. Jones's labour. They had a great work before them, but he thought that the expedition would be a success, and that the work would spread to all parts of the West Coast. They must get this coast to be as healthy as India. He did not believe that West Africa need be more unhealthy than India; and he believed that it was because Europeans did not know how to live there properly that the death-rate was so high.

Translations.

UNICUIQUE SUUM, PROF. J. B. GRASSI!
(EVERY MAN HIS OWN, PROFESSOR GRASSI.)

By Dr. SAUVEUR CALANDRUCCIO.

Professor of Zoology and Comparative Anatomy in the University of Catane.

(Translated from the French by P. Falcke.)

I AM constrained to publish the following facts in order that the gentlemen on the Committee of Examiners for the competition for the Professorship of Zoology, Anatomy, and Comparative Physiology should be made acquainted with the whole truth. After having worked for over thirteen years with Professor Grassi at Catane, that gentleman once in Rome entirely forgot his old partner in study, and on January 17, 1897, wrote to him as follows:—

"After your letter dated 14th of January, 1897, all communication not having relation to the study in progress on the Murenoïdes is at an end between us. I should like to see what you will do alone, and what precise part appertains to you in the works published in both our names and in my laboratory; the world will be able to judge this exactly by the results you will obtain alone and far away from me. The work on the Murenoïdes will be published in both our names provided that you continue to furnish the material you are able to collect."

To prove that I could work alone, without requiring his help, I published a series of works which, I trust, the Commission will examine impartially. From what I have said above, Professor Grassi's intentions are quite clear, for since 1897 he threatened that he would not state precisely what portion of the work done by us in common was due to me. Does it not appear like extortion when he expresses himself thus: *"The work on the Murenoïdes will be published in both our names provided that you continue to furnish the material*

you are able to collect!" But not only did Professor Grassi profit by the material, he profited still more by my ideas and by my observations, as may be gathered by consulting various letters of advice I addressed to him, and the copies of which I have kept. But let us pass to other matters. I declare with all the power of my conscience that all the works published in my name alone are entirely my own, and Professor Grassi had nothing to do with them. If he did have anything to do with them it was to pirate from them. Of this I will give an example. I described the *filaria recondita* of the dog, and he, having in hand the publication of my work, made a summary of it for a German journal, and wrote to me as follows: "*The article on the filaria has already been sent to the printer's. I have written on the top 'Professor Grassi in collaboration with Dr. Calandruccio,' and I have mentioned that the illustrations and descriptions are taken from your medical essay, and that you found the nematode in the tick (RHIPICEPHALUS SICULUS, Koch).*"

The real truth, however, is that the work belonged to Calandruccio entirely, and Grassi had taken no part in the same. It was Calandruccio who was the first to discover the embryos in a filarid dog belonging to Dr. R. Cannizzaro, and the larvæ in the fleas and in the ticks of the dog, as also in the fleas of man. Very well, the preliminary notes appeared with the two names.

Calandruccio discovers the cycle of evolution of the *ascaris lumbricoides* and of the *tricocephalus dispar*, and shows the experiments to Grassi who praises them and says: "I shall publish a note in your name in a German paper." This preliminary note duly appeared, but not under my name but under his, thus expressed: "My pupil Calandruccio," implying that I had studied under his direction, whereas I had not made my observations in his laboratory, and he was ignorant of them before my communication.

Calandruccio, in 1885, discovers a new arachnide arthrogastre (*Kaenia merabilis*); we studied it together and the preliminary note with our two names appeared in the *Naturaliste Sicilien*; Professor Grassi at once writes the observations *in extenso* without mentioning Calandruccio. I ask is this or is this not a serious—well, I will content myself by calling it merely indelicacy?

This, however, is not all. Calandruccio discovers the transformation of the Leptocephalides into Murenoïdes, it costing him 6,000 francs out-of-pocket expenses; he falls ill from acute nephritis caused by overwork; hardly recovered he enthusiastically pursues his studies, and experimentally completes the cycle of evolution of nearly all the leptocephalides into murenoïdes, and particularly of the eel.*

Now Professor Grassi, having everything in his own hands, and taking advantage of a very upright communication I made, writes that my name can no longer appear with his, and he gives me six months in which to publish what I had discovered

in relation to this work, to enable him in the meantime to publish on his own account the investigations he had made. He adds that the scientific material which I asked him to return were in a bad condition.

What was Professor Grassi's motive in taking this step? He knew very well that even several zoologists working in conjunction could not accomplish in so short a time a work which had taken six years of steady work; he knew that all the materials, my ideas and my researches were in his hands; he knew therefore that if I compiled so extensive a work I should have to depend almost exclusively on my memory, and should consequently be inaccurate; he knew that for making the plates alone six months would not be long enough even if I worked all day.

Is this an honourable mode of proceeding? Those persons who read these few pages shall judge.

Every argument I could use to persuade Professor Grassi to change his mind failed, so that in spite of myself I am driven to have recourse to competent tribunals to prove that dishonesty must have a limit.

Then Professor Grassi, with a view of exonerating himself, accused me of ingratitude and worse; nevertheless, I should like it to be known that I have treated him very liberally. He could not deny that his work on the procreators of the insects and myriapods were not to a great extent my work and had cost me much labour. Professor Calandruccio worked without relaxation for seven years on the notes on the termites, and Professor Grassi not being able to absolutely deny the collaboration, sheltered himself by saying: "*I thank Dr. Calandruccio for the assistance he has given me in this work.*"

If my researches and my observations, as also those of Dr. Sandias, were taken away, what would remain to Grassi of the work on the termites? Certainly very little.

Calandruccio, after numerous and wearisome experiments, discovers that the *tania nana* develops direct in man, and Professor Grassi takes the credit of the discovery to himself.

And what shall I say about malaria in regard to studies made at that time in Catane? Calandruccio made the experimental project, spending much money for the necessary materials, he carried on researches, demonstrated that there is no polymorphism, &c., and, being threatened by proceedings, Grassi took fright and asked Calandruccio himself to give him certificates to prove that he (Grassi) had nothing to do with this affair.

Notwithstanding all this, Grassi appropriated the merit of the work of someone else.

It is well to remember that Professor Grassi in his book "*Studi di un zoologo sulla malaria*," does not mention Calandruccio's work at all, though he knew very well to what extent he contributed to the actual knowledge of the stability of the species of malaria parasites and to the non-transmission of malaria by means of water. I pass over in silence many more facts that I could mention for the honour of science, but I cannot keep silence on this last performance.

Calandruccio discovered the larvæ of a filaria in

* For this Grassi received the Darwin prize of the Royal Society.

cushions. He at once went to the *Simeto* (Piano di Catania), and in an inn found many infected cushions; he examined the domestic animals and confirmed the fact that the dog is the definite host.

Lately Grassi announced this discovery as having been made by him, and no mention was made of Calandruccio except to lower him and place him in a bad light.

If certain great zoologists, more or less frail, were denounced to the Crown Prosecutor for their continual prevarications, and for the petty thefts they have committed from cabinets and museums, they would certainly have to exchange the professor's chair for the prison. But one's self-respect and the fear that during this time, while competitions are taking place, one might be accused of extortion, impels one to silence for the time being.

In conclusion, Professor Grassi ought to have a little more respect for those who have studied long and arduously, and, what is more, should not torment them by doing harm from malice, so as not to force them to demonstrate to the world, scientific and profane, that his greatest merit is to play the pirate, to speak evil of everybody, and to enlarge those points of science on which others have already thrown a bright light.

Rome, October 11, 1900.

P.S.—Professor Grassi obtained the Darwin medal at the London Academy for his work on termites, and for his researches on the transformation of the leptocephalides into Murenoides. He at once wrote to Calandruccio, who had not attended the Congress, to say he could not send him half the medal, and that of the 2,000 francs received, he intended to keep 1,000 francs, and 1,000 francs had been spent on the plates of their common work.

DOES MALTA FEVER EXIST IN HAVANA?

By Dr. EMILIO MARTINEZ.

(Translated from the Spanish by P. Falcke.)

In addition to the number of infectious fevers such as infectious enteritis, enterosepsis, &c., there has been known for some years in Havana a feverish illness of long duration and varied symptoms, the etiology of which our principal medical men do not exactly know, though all are unanimous in the view that it is neither malaria nor typhoid fever.

It seems to me that this disease is no other than Malta fever, an opinion I shall demonstrate clinically. Dr. Juan N. Davalos, in a communication to the Academy of Science entitled "Does Malta Fever exist in Cuba?" and which communication was published in the *Cronica Médico Quirúrgica* of January 15, 1899, presented some facts which go far to confirm the existence of the illness in Cuba, and he expressed the necessity of employing the serum reaction in suspicious cases. In one case I tried this serum reaction with a culture supplied to me by Dr. Juan Guiteras, with negative results. The doctor sent some of the same culture also to Dr. Davalos, who first propounded the question as to the existence of Malta fever in Cuba, for his in-

vestigations, but Dr. Davalos informed me that with him also the serum reaction, carried out subsequent to his work at the Academy, had negative results.

Although this bacteriological experiment, that would have been decisive in this connection, failed, yet the clinical analogies between this disease in Havana, and Malta or undulant fever, so graphically described by Hughes, is so marked that we are impelled to direct the attention of our colleagues in Havana to it, and to ask their co-operation to solve the problem.

The most common form of Malta fever is the undulant type which is characterised by a febrile period of long duration (months and years), with such gradual variations of temperature, that it appears like one single fever forming great waves, and in which the apparently afebrile periods are really part and parcel of the ailment, being mere intervals in the feverishness. The cases here presented are in character and symptoms such as are exhibited in actual Malta fever.

CASE 1.—Mrs. M. C. B., white woman, aged 30, without pathological antecedents. She was taken ill on August 22, 1898, with high fever, rigors, and pains all over. The tongue was coated, and the patient was very constipated. During the first days of September pain set in in the right arm at the elbow joint, attended by swelling of the tissues at this spot. Bisulphate of quinine proved useless (it was administered three times without modifying the fever), as also did salicylate of soda. The temperature rose to 39 degrees C. and fell to 38 degrees C. next day. The temperatures on some days rose to 40 and 40.5 degrees C. On September 11, in conjunction with Dr. Rensoli, an incision was made in the swelling at the elbow, and, instead of finding pus, we only encountered serous infiltration of the tissues. On October 4, a painful swelling occurred on the interphalangeal articulation of the left forefinger, and in November another painful swelling on the shoulder joint appeared.

The fever during the whole of this time had not fallen below 38 degrees C., but there were no further symptoms beyond constipation and marked emaciation. Commencing on November 30, a gradual defervescence set in, the temperature, after ninety-eight days of fever, reaching 37 degrees C.

To recapitulate: There was continuous fever of a remittent type of between 38 and 39 degrees, lasting ninety-eight days, and accompanied by constipation and sweats. There were articular non-suppurative swellings; all the viscera were normal. A paralysis of the extensors of the right arm was observed after the illness had been present some time.

The treatment consisted of alteratives (small doses of calomel and sulphate of soda every three or four days) and sponge baths during the high fever. Milk diet during the first month, and ordinary food in addition.

CASE 2.—X. X., man, aged 34, of a robust constitution, fell ill April 19 with rigor and fever of 40 degrees, insomnia, headache and general pains, coated tongue and constipation. During fourteen days the fever remained between 38 and 39 degrees without other symptoms than disorders of the diges-

tive system; the fever decreased slowly; alterative treatment and quinine given to saturation without modification of the fever. The patient only kept his bed a week and decreased 14 lbs. in weight during the fourteen days of illness. Three days of apparent apyrexia with a temperature of 37 degrees followed, to give way to another attack of fever as violent as the previous one. This attack lasted ten days, but the patient did not keep his bed. The former treatment with quinine proved equally inefficacious, and the emaciation was this time worse than the time previously. Renewed apyrexia of fifteen days, giving place to a third attack of fever of twenty-one days' duration with the same symptoms as previously. The emaciation was now so extreme that his friends hardly recognised him. There was then a remission of thirty days followed by a fourth attack as severe as the previous ones, and this time complicated by a suppurative enlargement over the sternum which resisted all treatment, and only healed after being incised. The patient recovered.

To summarise: Four attacks of fever lasting from fifteen to twenty days each, with intermissions of ten or twelve days' duration; no other symptoms than a fever of remittent type, accompanied by constipation and marked emaciation. This case was also observed by Drs. Fernando Rensoli and A. Abril.

CASE 3.—C. L., a strong boy, aged 9 years; no pathological antecedents. He was taken ill on May 15 with high fever of a remittent type accompanied by severe articular pains and constipation. The fever continued from this time during the whole of June and the first fortnight of July. At this time he was under the treatment of Dr. Coronado, who prescribed aperients and quinine without results. Besides the articular disorders he was delirious during the days of hyperpyrexia, with symptoms of nervous excitement.

A week of apyrexia followed, to give way gradually to fever of a nature similar to that of the first attack, and which did not abate till September 30. A subsequent intermission began in October, the patient improving in health considerably during this interval. The fever re-appeared on October 20, and was this time accompanied by acute pain and articular swellings. After lasting till the middle of January the fever commenced to subside gradually and at last disappeared.

During the whole course of the illness the patient had no symptoms but articular pains, constipation, flatulence and emaciation. Quinine, though administered several times, exercised no effect whatever on the fever.

The clinical history of these three cases exactly resemble in character that of undulant fever. In the first case there were long waves lasting ninety-eight days. In Cases 2 and 3 the undulations were still more marked because the base of the wave (the intermissions) were approximately 37 degrees C., a temperature which, as Hughes says, is not apyrexia, for it is only those who have recovered, or who are actually convalescent that have subnormal temperatures. The second case lasted 114 days (without counting the complication) and had four undulations. The third case had eight months of fever with three waves, and one that was incomplete. The pro-

longed duration is another characteristic of Malta fever.

The mildness of this type of fever in Havana also much resembles the benignity Hughes drew attention to.

These three cases also exhibit the articular localisations which according to Hughes occurs in 40 per cent. of the cases, and are therefore to be considered as specific to the illness.

As to the constipation and flatulence, these remain present and do not entirely disappear until convalescence sets in.

The paralysis of the extensors which occurred in the first case during the second year of the illness is a late complication, and Wescott, who studied this symptom, is of opinion that it never sets in previous to the fourth month of fever. We think we have succeeded in establishing the identity of Malta fever with our so-called infectious fever, which is undoubtedly of an undulant type; and further we can no longer doubt that we have in our midst the malignant type also of this disease, though as yet we have not sufficient clinical evidence to affirm the fact, for the malignant type of the disease is often confounded with tropical dysentery.

I have carried out my purpose of directing the attention of our medical men to this obscure point of tropical pathology, and it would be well were they to examine the blood of their patients to prove by the positive serum reaction of the micrococcus melitensis whether undulant fever is prevalent in Cuba or not.—*Revista de Medicina Tropical*, April, 1901.

DISEASE AMONG THE NATIVES OF THE NYASALAND PLATEAU.

By STANLEY KELLETT SMITH, F.R.C.S.Eng.

(Reprinted from the "*Liverpool Medico-Chirurgical Journal*, March, 1901).

THE study of tropical diseases has, in these later years, assumed such interest and importance that I have been tempted to commit to paper a few notes from my medical diary kept during the exploration of the country between Lake Nyasa and the Muchinga Mountains in the years 1895-96.

The manner of physical man we have to deal with may be judged from the following measurements. The statistics are of males only, and in each case great care was taken to select subjects of pure breed.

Measurements were made as follows:—

HEAD.—

Length—(a) Greatest calliper span with the glabella as the anterior part; (b) tape measurement from glabella to external occipital protuberance.

Breadth—(a) Greatest calliper spans. (b) Tape measurement across vertex, between zygomatic tubercles.

ZYGOMATA.—Greatest calliper span between the cheek bones.

NOSE.—(a) Length from tip to root. (b) Calliper breadth of nostrils.

CUBITAL.—From tip of olecranon to tip of extended middle finger.

SPAN.—Between tips of extended middle fingers, with arms abducted at right angles to the trunk.

STATURE.

SITTING HEIGHT.

The head measurements, together with the cubital, were taken in the metric system. The span, stature, and sitting height are expressed in feet and inches.

Taking the individual measurements from which the averages were derived, one notices much less difference between them than would be the case if dealing with subjects of a civilised race. The correlation is better; the type is more uniform.

	Atonga.—From Bandawe and neighbouring Villages on Lake Shore. Average of 25 Adults.	Wa-Bisa.— From Kamb- wire's Kraals. Average of 17 Adults.	Wa-Gunda.—From Chuaula's Kraals. Average of 23 Adults.
Head.—	C.	C.	C.
Length—(a) ...	18·62	19·2	18·61
(b) ...	33·36	34·45	32·56
Breadth—(a) ...	14·73	15·04	14·7
(b) ...	34·4	33·97	34·35
Zygomata ...	13·77	14·18	13·36
Nose—(a) ...	4·09	4·2	4·21
(b) ...	4·3	4·4	4·2
Cubital ...	46·42	46·83	47·8
Span ...	5' 7 $\frac{1}{4}$ "	5' 7 $\frac{1}{4}$ "	5' 10 $\frac{1}{16}$ "
Stature ...	5' 4 $\frac{3}{8}$ "	5' 5 $\frac{1}{8}$ "	5' 5 $\frac{1}{8}$ "
Sitting Height ...	2' 7 $\frac{3}{8}$ "	2' 10 $\frac{1}{8}$ "	2' 8 $\frac{1}{2}$ "

In point of muscularity the native is of very fair development. The thighs and the muscle-groups parallel to the spine are his best points. Without being actually a strong man, he is capable of great endurance. The journey between a certain station in Northern Angoniland and Bandawe, roughly about sixty miles, and a very bad road, has often been covered well within sunrise and sunset. The porters of a caravan, each carrying a load of half-a-hundredweight upon his head, will travel at a pace which, taken over a long march and for a whole day in cool weather, or from 6 a.m. to noon in hot weather, and excluding occasional brief stops, will give a mean of 2½ miles per hour, and this will be kept up for several weeks at a stretch, the daily march being taken as about twelve miles.

The native is not a long liver. Old age is rare, and the vital average might range with our own statistics of the twelfth or thirteenth century.

The majority of the local ailments are very trivial. Common cold and slight digestive disturbances, together with mild attacks of malaria, pretty well fill up the usual medical cases, and the surgeon has to deal chiefly with ulcers—the sequence of wounds or of the “chigoe”—which have taken bad ways through the native habit of plastering up sores with leaves of various trees supposed to possess healing properties. Death results generally, apart from violence, as the result of some acute general disease. Malaria accounts for many, attacking the inhabitants not so frequently as the white stranger, but presenting often in the former an unusual severity and a high average of serious complications. Smallpox is

endemic, the central countries of Africa and India being its native foci. Tetanus appears, but is not frequent.

Rabies exists, and its fatality is recognised. One day our camp in Mombera's country was thrown into utter confusion by a sudden stampede of all attendants and of certain chiefs who were engaged in a palaver with us. Warnings were shouted from every side, “*Garu! Garu!*” and a native cur came rushing blindly through, head down, tongue out, and rosy saliva dribbling from the mouth. It was subsequently shot, and a *post-mortem* examination showed many signs of rabies.

Stomach contained pieces of half-digested bone, together with considerable quantity of grass, twigs, sand, &c. Mucous membrane injected in parts, with small hæmorrhages.

Epiglottis much injected and inflamed, with capillary hæmorrhages on its sides and posterior surface. Lymphoid follicles at base of tongue swollen. Much sticky mucus about fauces.

Brain.—Hinder part of brain and medulla somewhat injured by shot by which the animal was killed. The sounder parts, on section, showed punctiform hæmorrhages.

A big chief who was present explained that “it was well to kill this dog, for men bitten by such might become like them and would then die.” No information could be obtained as to the occurrence of rabies among any of the various buck in the country—a point of interest in view of the outbreak among the deer in Richmond Park in 1887, and of the latter occurrence at Ickworth Park.

Deformities are not often met with. Even a common lateral deviation of the spine is very seldom seen—a result possibly of balancing the waterpots and other burdens upon the head, and thus strengthening equally the muscles acting directly upon the vertebral column. The starchy diet upon which the children are fed almost from infancy does not produce in them those osseous lesions of rickets which, with similar food, would be frequent in our own climate. Levacher's statement of the remarkable frequency of *fragilitas ossium* in negroes is certainly not supported by experience in this particular country.

Now among these people umbilical herniæ are exceedingly common, probably on account of the scant attention paid to the cord at birth. They never seem to cause trouble, however, and for the most part disappear spontaneously during the earlier years of life.

With inguinal hernia it is very different. This, by far the most common physical disorder with us, occurring in an almost incredible proportion of the male population, is so rare among them as to be practically unknown. The reasons for this great contrast are of interest.

In the beginning the mother carries her child seated on the prominence of the hip, its legs embracing her flank, and its whole weight borne by a simple sling carried to the opposite shoulder. Think for a moment of the position of the legs *in utero* and of their inclination at birth; the tendency to flexion of the thigh at the hip and to abduction of the whole limb are simply followed and main-

tained. The posture of the infant is entirely natural, so natural that an ardent Darwinist would almost expect the little one to reach up and gain its whole support by instinctively twining its fingers in the parent's axillary hair. One sees tiny mites of a very few days' existence nursed in this manner with perfect comfort.

The advantages to the child are obvious. If a male, the descended testis is kept in its place in the scrotum, an open *processus vaginalis* is encouraged to close, and the inguinal canal, still inclined to patency after the passage of the sexual gland, is adequately supported by the conforming pressure of the mother's side.

We, in our wisdom, take other ways. We bind down and almost splint the struggling legs by weight of swaddling-clothes, and still their protests by folding or pinning these after the manner of a sack. We fix a binder which overlaps its useful purpose of pressure upon the umbilicus and seriously hampers the free movements of the lower chest and of a great part of the abdomen. Thus we stretch and weaken the already feebler part of the abdominal walls, we remove from them the support of the flexed thigh, and make the delicate inguinal regions bear the brunt of every cough, and cry, and varying distension of the gut. We help the possible evil results of a tardy development, and find that the common hernia in the male "*occurs with extraordinary frequency in the first year of life.*"

The immunity as life goes on is no less striking. The boyhood and youth of the native are brief; puberty comes quickly under a fierce sun, and before our own children have well left school he is already taking upon himself the duties and responsibilities of the man. During all this time there is no very apparent reason why he should be free from inguinal hernia. Rather to the contrary. The young boy, with maize as the staple of his diet, grows a huge belly, out of all proportion to the rest of his body. The abdominal walls seem stretched almost to bursting point, and the resolved pressure together with the direct weight of the abdominal contents upon the inguinal regions are still further increased by the greatness of the lumbar curve, a greatness which is partly characteristic of the negro's build and partly exaggerated by the throwing back of the upper part of the trunk as counterpoise to the anterior weight of the intestines and omentum below. Again, throughout life his food supply is always fluctuating. At one time the abundant crops of the rainy season and all the prodigal fruits of his clime, at another time famine, when the precious store of seed corn is hardly spared and a mere sustenance eked out by the leaves of the forest and the roots of the bush; at one time a perfect picture of rotund well-being, at another time a ghastly model of skeletal anatomy. And rapid variations in the viscera and parietes such as these favour, we believe, the occurrence of rupture.

Why, then, his protection? The explanation may lie in two points. In the first place, the native is a practical believer in the doctrine of conservation of energy. He rarely puts to its full use any co-ordinate group of muscles. He objects to the rigid fixation of any part of his frame as the preliminary

to exercise of power, but depends for his efforts rather upon balance and the press of his body mass. There is all the difference in his actions as between the cricketer's stubborn, muscular drive, and the lithe, weight-transferring swing of the golfer. And so there are wanting those violent contractions of the trunk muscles which are so fruitful an exciting cause of hernia with us.

Secondly, and chiefly, a great deal must ensue from the position the native takes up when sitting, and especially when disposing himself to the necessary eliminatory functions. He squats down upon his heels like a huge grasshopper, with the back of the thigh touching the calf, and the body swayed forwards to the full flexion of the hip; a posture we have so far forgotten that it is not only uncomfortable but even difficult for the civilised man to imitate it. Yet the black, under these circumstances, does entirely what is most wanted and which we most neglect—he supports to the greatest possible extent, and at the time when it is most needed, those portions of the abdominal wall which are especially patent to the dangers of strain.

Syphilis is a disease of which all travellers assume a knowledge, even if they have it not. The usual reports of its universality were perceived and believed until the village of Maponda, at the southern extremity of Lake Nyasa, was reached. This has the reputation of being the most immoral village in this part of Africa, and was described as "simply rotten with syphilis." Immoral it certainly is. The people devote themselves for the most part to dancing, *pombé* drinking, and general licence. Every night and all night, from sunset to broad dawn, the tom-toms and *zuzes* are going ahead, with screechings, songs, and general hubbub as accompaniment. The *unyago*, or initiation dance with all its promiscuous attendances, is still carried on.

"Gather ye roses while ye may,
Old time is still a-flying,"

and a distorted version of the injunction to take no thought of the morrow, sum up the philosophy of life at Maponda's.

Syphilis then, did it exist, would be general. It would quickly become general if introduced into any of the native tribes, for pipes, food vessels, and drinking calabashes are used and passed round quite in common. No convincing evidence of the disease, congenital or acquired, was found either at Maponda's or at any point reached during our march, which, be it remarked, however, did not touch Karonga, or any other station inhabited by, or under direct control of, the Arabs.

One case of ulceration of the vulva was met with, in which the sores were almost phagedænic in virulence, but everything cleared up under rigorous local antiseptic measures, and there were no subsequent results from constitutional mischief. So with several sores on the penis, which hardened up. Induration, we are apt to forget, may result from other causes than syphilis, and these softened and healed under application of pure carbolic acid, followed by dustings with iodoform.

Now scabies, on the other hand, is exceedingly common, especially on the Lake shore at points most

frequently visited by the white man, and a false deduction drawn from the skin rash is probably at the bottom of the error regarding syphilis. Confusion, too, may have arisen from the custom prevalent among some tribes of filing the teeth, one favourite pattern reproducing the position although exaggerating the size of the Hutchinson notches. Even a more critical observation might be deceived, for fever subjects, after unsuitable diet and long residence in unhealthy districts, may suffer from sores which are typically rupial in appearance. Examples were seen, both in blacks and whites, in whom a venereal taint could be absolutely negated.

It is curious that no traces of syphilis presented themselves. Opportunities of infection there must have been in plenty, for near and through this country, until very recent times, lay the great slave routes between the interior and the East coast where syphilis is rampant.

Livingstone's remark upon this subject is interesting. He says, "A certain loathsome disease, which decimates the North-American Indians, and threatens extirpation to the South Sea Islanders, dies out in the interior of Africa without the aid of medicine. And the Bangwaketse, who brought it from the west Coast, lost it when they came into their own land south-west of Kolobeng. It seems incapable of permanence in any form in persons of pure African blood anywhere in the centre of the country. In persons of mixed blood it is otherwise; and the virulence of the secondary symptoms seems to be, in all the cases that came to my care, in exact proportion to the greater or less amount of European blood in the patient. Among the Coronnas and Griquas of mixed breed it produces the same ravages as in Europe; among half-blood Portuguese it is equally frightful in its inroads on the system; but in the pure negro of the central parts it is quite incapable of permanence." So much for Livingstone's observations; and, passing through the country through which he travelled, I humbly beg to corroborate this great man's statements, and to agree relatively, though not perhaps absolutely, with his final conclusion.

It has been stated that there exists an antagonism between malaria and tuberculosis; that they are mutually exclusive; or, for the purpose of our argument, that tuberculosis does not occur in a malarious country, by reason of the very presence therein of the malaria.

The possibility of such opposition between the two most common organisms that prey upon ourselves is certainly fascinating, and for this reason, perhaps, the argument crops up with commendable regularity, despite the negative conclusion of advanced evidence. First formulated by Wells, and supported by Schönlein, it was keenly analysed by Boudin, who arrived at the deduction that "in localities where malarial disease is endemic, phthisis is rarely or never seen among those of the inhabitants who have been continuously or for a long period exposed to the malarious influences."

Taking for a moment the general proposition, the idea of direct antagonism between the two diseases has been gradually but steadily assailed. Many white men die in malarious Africa from pulmonary

tubercle. In England, malaria was at one time very prevalent in London, until the drainage of certain marshes led to its disappearance. Plymouth, Stourport, Bolton, and other towns are noted by Sydenham as dangerous fever spots, and yet we have no knowledge that at this time tuberculosis was any the less rampant than it is now. Again, since the advance of bacteriological knowledge, the plasmodium of malaria and the tubercle bacillus have been frequently demonstrated active at the same time in the same individual.

Certainly, tuberculosis is a rare lesion in South-East Central Africa, but it is so because of the general climate and configuration of the country. An elevation of 2,000 to 5,000 feet above sea-level, a clear and uncontaminated atmosphere, with an essential out-door existence, temperature showing an average shade maximum of 87 degrees and a minimum of 61.7 degrees, unclouded skies and a great amount of direct sunshine, are conditions by no means favourable to the growth of its specific organism. It does occur, however, among the natives. The following are examples of different phases in which it presented itself:—

(a) A case of advanced caries in lower dorsal region, with fluctuation on either side of spine.

(b) Tubercular glands in neck, the nature of which was rendered still more evident, in one case, by their excision.

(c) Several cases of cured hip disease, with typical histories and scars of healed sinuses.

(d) A certain chief, who had consolidation of both apices and all clinical signs of phthisis.

In many cases of continued fever, in cases of slight persistent pain, or of marked inflammatory mischief of the lungs or abdominal viscera accompanied by pain, cupping is largely resorted to. The operation is beautifully done by the native medicine man, and stoically borne by the patient. The *modus operandi* is as follows: The skin over the spot selected is covered with oil, or this being wanting, the few drops of blood first drawn are used for the adhesive purpose. Incisions are then made well through the skin with a sharpened knife or assegai point, care being taken that the series shall form, when complete, a pattern or figure. A cow's horn is pressed firmly down with its base encircling the whole, and the "doctor" encourages the flow of blood by sucking away and exhausting the air through a hole bored in its tip. The total quantity withdrawn is not excessive; six to eight ounces would be the limits of the average.

The whole performance is a leisurely proceeding, just tinged with the necessary suggestion of mysticism and of marvellous skill. This and the shedding of the blood render it a great open-air entertainment for the people of the village. In another light, the whole thing, in certain ways, offered an irresistible caricature of the pomp and circumstance of many a modern antiseptic crusader.

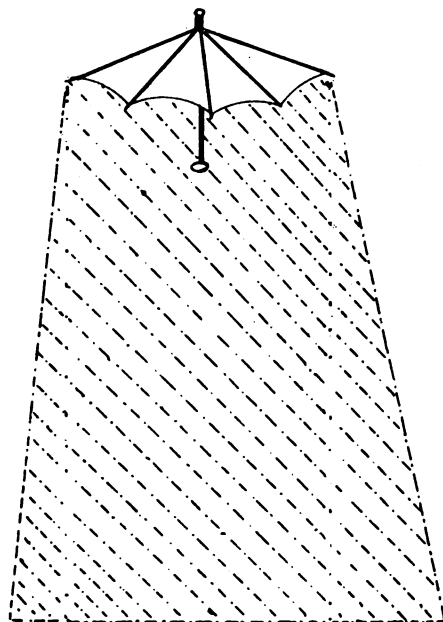
The patient's chief concern after recovery is concerning the fate of the scars. These are encouraged as a rule to excessive formation of scar tissue by the rubbing in of certain "medicines," or of finely powdered wood-ashes. Cicatrices in the black seem always to have a tendency to become keloid, and

with them the *keloid* never takes on malignant tendency. Great hard plaques, knotted and gnarled, the result of burns, and fit for illustration of the subject, are regarded with pride by their owners, and many also are seen, especially across the chest, whose greater symmetry confirms their production by design. In face of the unvarying and continued innocence of such it is interesting to analyse our own suspicions of these growths.

Still more to be remarked is the fact that *malignant tumours, either of epithelium or of connective tissue, occur so very rarely in this primitive part of Africa, that they may be said to be unknown.* A quarter of a century's missionary practice in the Shire Highlands and upon the shore of Lake Nyasa has given the Rev. Dr. Laws a solitary case of tumour of the parotid gland, which recurred after removal, and which had at least all the macroscopic appearances of a malignant growth. A second case of a possible epithelioma of the tongue is on the doubtful list. These stand out alone as the result of a vast experience.

Many causal deductions might be made—all futile in the present state of our knowledge. But perhaps there is no greater contrast, no fact more provocative of thought, especially to us in cancerous Liverpool, than this remarkable absence of malignant disease among the natives of the Nyasaland Plateau.

PORTABLE FOLDING MOSQUITO NET.



WE are indebted to P. Carmody, F.I.C., F.C.S., Government Analyst and Professor of Chemistry, Trinidad, B.W.I., for the note and sketch regarding the portable folding mosquito net.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

SIR,—I beg to submit a rough sketch of a portable folding mosquito net designed for the use

of travellers in the tropics. It is either attached or attachable to the ordinary linen umbrella which forms a part of every tropical outfit, and the combination affords protection from the sun during the day and from mosquitoes during the night. The design has been registered recently.

I remain, &c.,
P. CARMODY.

Current Literature.

THE COMPARATIVE PATHOLOGY OF THE JEWS.—It is difficult to obtain exact data concerning the vital and pathological statistics of the Hebrew race. Several, however, are fairly well established, and the following statement, made by Dr. M. Fischberg in the *New York Med. Journ.* of April 8, 1901, is of interest. The death-rate amongst Jews is lower than that of their neighbours of any nationality. The marriage and birth rates are lower than in the case of Christians; the increase in numbers being therefore due to less loss by death, and by bringing more children to maturity. Jews suffer less from several infectious diseases such as cholera, smallpox, and tuberculosis, than their neighbours. Syphilis in Jews is relatively rare; probably due to circumcision, but possibly also to other obvious reasons—selection, &c. Alcoholism is also rarely met with amongst Jews. All organic nervous lesions are infrequent, due, no doubt in a great measure, to the absence of syphilis and alcoholism. The ailments to which Jews are *peculiarly liable* are: Diabetes, functional neuroses, insanity, idiocy in children. glaucoma, hernia, varicose veins, and hæmorrhoids.

Jews attribute their immunity to certain prevalent diseases to the care with which they prepare and dress their food. That this has directly to do with the immunity in Western Europe may be called in question; but that the general attention paid to their food and hygiene generally, as betokened by the rules they follow in preparation, plays an important part is very probable.

A URIC ACID SOLVENT.—*Urosin*.—A combination of $7\frac{1}{2}$ grains quinic acid, $\frac{1}{2}$ grain carbonate of lime, and $4\frac{1}{2}$ grains of pure white sugar in the form of tablets, and styled urosin tablets is highly spoken of in certain quarters as a uric acid solvent. Uric acid, which is so insoluble in water (1 in 14,000), is changed into benzoic and then into hippuric acid in the urine. Hippuric acid is soluble in the proportion of 1 to 600 of water. One to two tablets may be given three or four times a day.—*Therapist*. June 15, 1901.

TEARS AS A REMEDY.—In Persia the tears bottled at funerals and during mourning for the dead possesses, in the opinion of natives, a therapeutic value. The tear-shedders are each given a sponge to mop face and eyes, which is afterwards squeezed and the tears preserved in bottles. The ailments for

which they are exhibited are not mentioned.—*Therapist*, June 15, 1901.

MEDICAL PRACTICE IN THIBET.—Dr. Susie C. Rignhart, in her book "With the Thibetans in Tents and Temple," describes some of the medical practices she observed amongst the Thibetans:—"For headache, large sticking plasters are applied to the patient's head and forehead; for rheumatism, often a needle is buried in the arm or shoulder; a tooth is extracted by tying a rope to it and jerking it out, sometimes bringing out a part of the jaw at the same time; a sufferer with stomach-ache may be subjected to a good pounding, or to the application of a piece of wick soaked in burning butter grease. If medicine is to be taken internally, it will consist probably of a piece of paper on which a prayer is written, rolled up in the form of a pellet, and, if this fails to produce the desired effect, another pellet is administered composed of the bones of some pious priest."

MAJOR RONALD ROSS'S EXPEDITION TO WEST AFRICA.—On June 15, the fifth "malarial" expedition sent out by the Liverpool School of Tropical Medicine sailed in the s.s. *Axim* from Liverpool. Dr. Logan Taylor accompanies Major Ross, F.R.S. The expedition started under the happiest auspices, many friends assembling to say good-bye and to wish God-speed.

We wish to add our good wishes for the success of the expedition, and for the safe return of Major Ross and his coadjutor, Dr. Taylor.

The Section of Tropical Medicine, at the British Medical Association meeting in August at Cheltenham, will be, by Major Ross's journey to West Africa, deprived of the presence of its distinguished President.

NO LEPROSY IN THE FAROE ISLANDS.—We are assured on excellent authority that there is no leprosy in these islands, and that there is no history of there having ever been a leper home there. Since leprosy prevails so extensively in the neighbouring countries of Iceland and Norway, it becomes of much interest to ascertain what conditions have conduced to its extinction in the Faroes. In the Orkneys and Shetlands, where leprosy was formerly prevalent, it has become extinct within recent times.—*The Polylinic*, June 1, 1901.

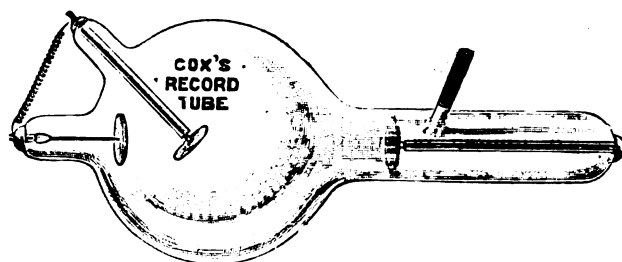
A NEW series of articles, dealing with the practical side of microscopy, together with notes and queries, correspondence, and description of new apparatus, are appearing each month in *Knowledge*, under the editorship of M. I. Cross, joint-author of the well-known handbook, "Modern Microscopy."

THE RÖNTGEN RAYS AS A MEANS OF TREATMENT IN LUPUS, &c.—In addition to its value in diagnosis the Röntgen Rays are being seriously considered and applied as a remedial measure in several diseases. Electric light has increased our therapeutic resources in a marked manner, and now the

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We have had no official report of leprosy being systematically treated by electric light or by Röntgen Rays, but we hope soon to hear of its being so.

To further these ends, Messrs. Harry W. Cox, Ltd., Electrical Engineers, of Cursitor Street, Chancery Lane, London, have applied themselves, and the result appears excellent. The firm has adapted an apparatus to be used with the Röntgen Rays for treatment of lupus, &c., which costs much less than the electric light apparatus, which need be applied for fifteen minutes only in place of the two hours required for the light treatment, and which causes no pain or discomfort during application. A medical man therefore, supplied with the Röntgen Ray apparatus, can administer the "light" treatment without the necessity of obtaining a separate plant.



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HÆMOGLOBINURIA.—Ziemann has had considerable experience in blackwater fever, and as a result has come to the following conclusions:—Blackwater

fever is not necessarily associated with general hæmorrhagic diathesis. In some districts where malaria prevails, some persons exhibit a liability to blackwater fever after having had one or several attacks of malaria. Ordinary tertian or quartan fever is considered capable of originating blackwater fever, but the predisposition to this is mostly possessed by persons who have had tropical or æstivo-autumnal fever.

Ziemann is of opinion that blackwater fever may ensue, (1) as a consequence of a fresh attack of malaria; (2) as a consequence of a fresh attack of malaria, especially when quinine has been used; (3) in persons with a predisposition to blackwater fever it may be provoked by the use of quinine, even without a fresh attack of malaria; but this is of rare occurrence, for Ziemann has observed blackwater fever in the negroes of Tagos and elsewhere who have never taken quinine.

In very mild cases the disease is only indicated by a slight brownish hue of the urine. In one case, complicated with tropical malaria, $\frac{1}{14}$ grain of quinine produced albuminuria, and $\frac{1}{8}$ grain of quinine produced hæmoglobinuria.—*Deutsche Med. Wochenschrift*.

PLAGUE.

CAPE COLONY.

Since the commencement of the outbreak of plague in Cape Town, 735 persons have been attacked by the disease, of which number 354 ended fatally. A few plague cases have occurred at Simonstown and at Port Elizabeth, but with these exceptions the disease has not spread much beyond Cape Town.

INDIA.

The number of deaths from plague in all India during the week ending June 8, amounted to 829, about half the number for the previous week. In all parts of India, except in the Mysore district and in some of the districts on the Punjaub and Cashmere frontiers, the virulence of plague is subsiding for the time being.

HONG KONG.

The sixth epidemic of plague is running its course in Hong Kong. For the week ending June 22, 155 cases of plague occurred in Hong Kong, and 152 deaths were reported.

EGYPT.

A limited recrudescence of plague has occurred in Egypt. Zagazig seems to be the town most seriously threatened, but cases have also occurred at Mansoorah and Minieh.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology
British Medical Journal.

Brooklyn Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Exercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
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2.—Manuscripts sent in cannot be returned.

3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

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The Journal of Tropical Medicine.

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Original Communications.

THE CLASSIFICATION OF MOSQUITOES.*

By F. V. THEOBALD, M.A., F.E.S.

THE mosquitoes, gnats, or *Culicidae* were originally all contained in four genera—*Culex* and *Anopheles*, *Aedes* and *Corethra*. Of these even now there are only two groups referred to in medical journals (*Culex* and *Anopheles*). The genus *Culex* has been a sort of harbour of refuge for all *Culicidae* except *Anopheles* and the large *Megarhinus* and *Aedes*, and contains many forms quite as diverse from one another as *Anopheles* are from *Culex*: some even more so. It is thus very important from a practical point of view in connection with the malarial question to sift and sort out and to arrange these various so-called *Culex*, many of which are generically quite distinct from the typical *Culex*, such as our European *C. pipiens* of Linnaeus and the tropical and subtropical *C. fatigans* of Wiedemann.

If there are sufficient differences between these old *Culicids* to be of generic importance scientifically, there may be and probably are very important internal structural and physiological deviations.

At present all the blame of malaria-carrying is placed on members of the genus *Anopheles*. It has been said more than once that *Culex* does not do so. What *Culex* have been experimented with? *C. fatigans*, Wiedemann; *C. annulatus*, Meigen; *C. pipiens*, L.; *C. penicillaris*, Rond; *C. pulchritarsis*, Rond; *C. vexans*, Meig.; *C. nemorosus*, Meig.; *C. albopunctatus*, Rond; *C. spathipalpis*, Rond; *C. hortensis*, Fic.; *Teniorhynchus Richardii*, Fic.; *Stegomyia fasciata*, Fab., and *Aedes*: all these are true *Culex*. But many species that have been considered as such I find are very different. These I have raised to distinct genera, and from what we

know of some of these new genera they have very different life-histories to *Culex* proper. Before we can place all the blame on *Anopheles* we must see if any of these new groups can serve a similar obnoxious and posterior cross-veins. But too much reliance rôle. Hence to-day I am going to try and point out the characters by which the old and the new genera of the *Culicidae* can be distinguished.

In formulating the new genera, and in, to some extent, re-modelling the old, I have made most use of the scale structure. The palpi and unguis which have been used as generic characters by Arribalzaga, have had to be discarded. Not until I had examined some thousands of specimens, embracing three hundred odd species from different parts of the world, did I decide upon any general grouping of these pests, but after due consideration I found the scale structure was the only one upon which I could form a satisfactory division of these insects; other characters, such as palpi, unguis, &c., being seen to be of specific but not of generic value.

It is therefore necessary to explain the general structure of a typical mosquito and the scales which cover it, and which give the creatures their often gorgeous colours.

The mosquito, like any other hexapod, can be divided into three main parts—(1) the head, (2) the thorax, and (3) the abdomen.

(1) *The head* bears on its lateral halves a pair of compound eyes, reniform in shape, a pair of jointed antennæ, pilose in the female, plumose in the male, these are not subject to much variation, but a few very important modifications appear upon which two new genera have been formed (*Deinocerites*, Theo., and *Brachiosoma*, Theo.) Of the mouth parts I need only speak of the palpi, as they vary tremendously. In the female they may be long (*Megarhinus* and *Anopheles*), or short (*Culex*, *Aedes*, *Stegomyia*, &c.). In the male also they may be either long (*Culex*, *Anopheles*, &c.) or short (*Aedes*, *Uranotaenia*, *Wyeomyia*, &c.). The numbers of joints vary from two in *Aedes* to four in *Anopheles*, or five in *Megarhinus*. These joints are generally difficult

* A lecture given at the London School of Tropical Medicine.

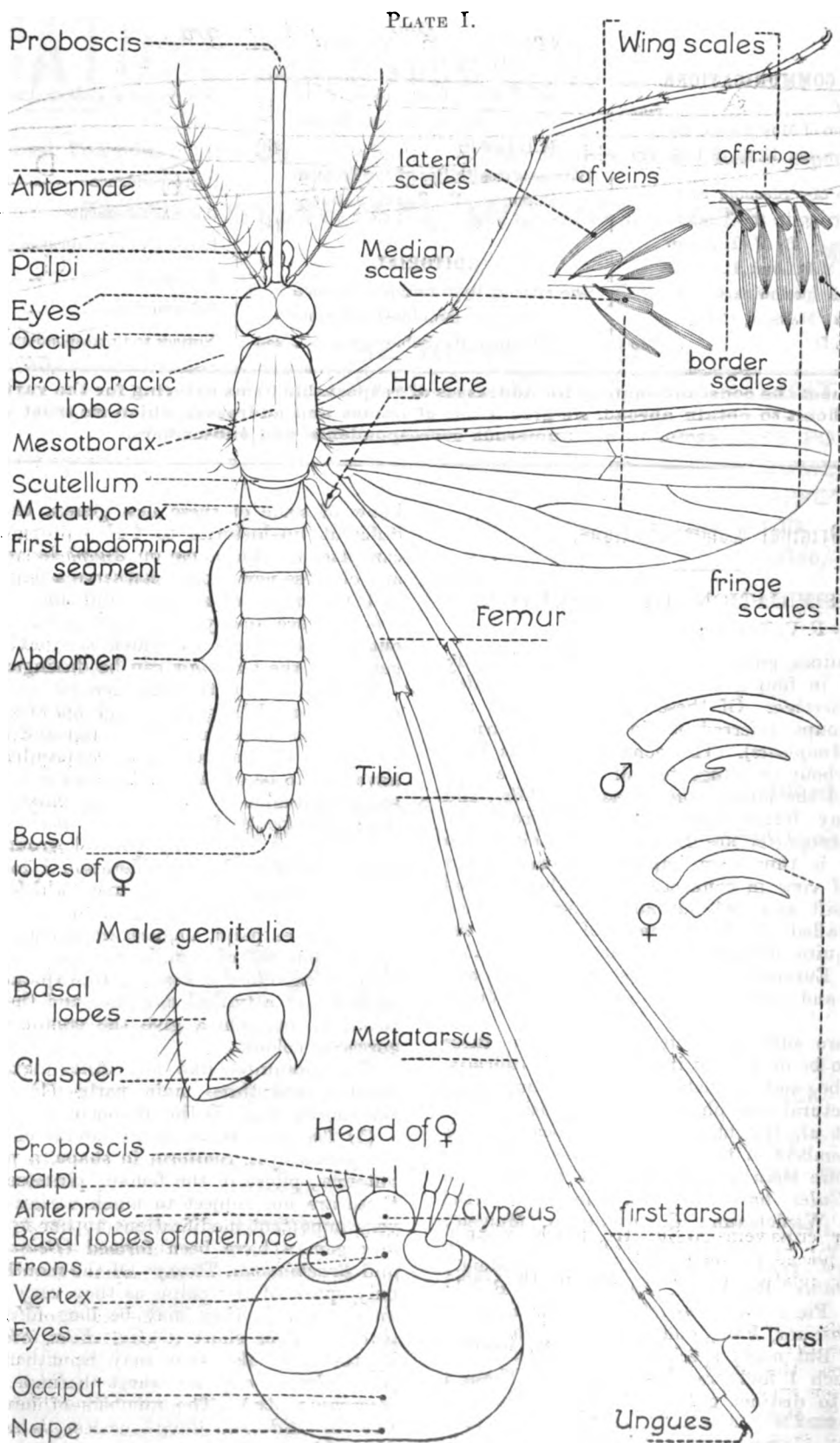
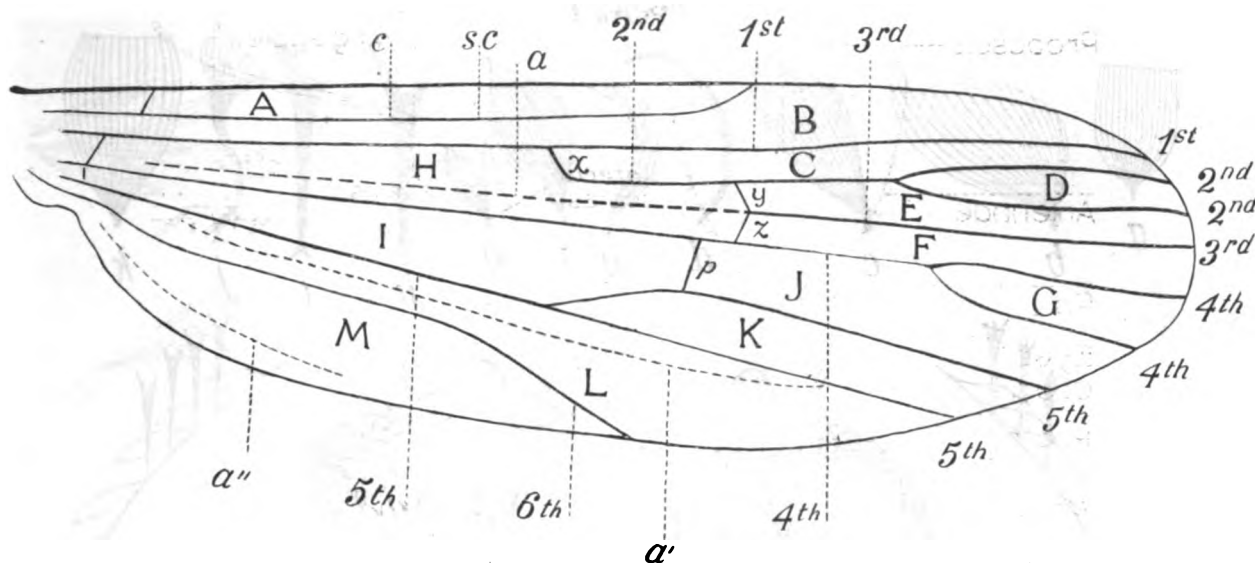


PLATE II.



to see in museum specimens. There are also constrictions towards the base of the palpi which have been erroneously taken for joints. Too much importance should not be attributed to joints in palpi, as they are liable to cause grave errors, being covered with scales which hide the segmentation. With regard to the thorax we find all three divisions present, but the main area is the mesothorax, the prothorax being reduced to a pair of lobes, and the metathorax is very small and nearly always nude. Between the meta- and mesothorax comes a plate, the scutellum, which is usually trilobed (*Culex*, *Stegomyia*, &c.), but may be simple (*Anopheles*). The thorax bears a pair of wings and the six jointed legs attached to the lower lateral surfaces, the pleurae.

The wings have the veins and the whole border covered with scales, which are of generic importance, while the venation is also of great use in classification. On the wing field are six longitudinal veins. There is one surrounding the border of the wing called the costa, the others are spoken of as the first, second, third, and so on, longitudinal veins; the second and fourth longitudinal veins are forked apically, the forks forming respectively the so-called first submarginal cell and the second posterior cell. In some genera the "fork-cells" are very small (*Megarhinus*, *Uranotania*), in others long (*Culex* and *Anopheles*). Between the long veins we find transverse or cross-veins; those of special classificatory value I find to be the supernumerary, middle, and posterior cross-veins. But too much reliance must not be placed on them as there is some variation in their relative positions even in the same species.

Of the legs I need say but little. The joints are known as the coxa (basal), trochanter, femora, tibia, and tarsi; the latter being five in number, the first being often spoken of as the metatarsus. The relative length of some of these joints may serve as a guide to separate two closely related species. The femora are swollen in some genera (*Uranotania* and *Anopheles*). The unguis or claws also offer

specific distinctions; in the female they are always equal, usually simple, but they may be uniserrated; in the male, the fore and the middle are always unequal, both may be uniserrated, and the larger one bi- or even tri-serrated; in a few they are simple, the posterior pair are always equal and simple, and usually small. I can detect no variation in these in any one species.

The abdomen presents no points of value save the genitalia of the male. The latter differs in most species, and in some cases are peculiarly modified. The so-called hypopygium consists of a pair of basal lobes and two claspers, which vary in form and arrangement.

Such briefly are the chief external structures of a mosquito that are of systematic value.

Scales.—Head, palpi, part of the thorax, abdomen, legs, and wings are covered more or less completely with scales. These scales may assume very various forms (Plate 3, figs. *a* to *k*), but they may be reduced to about six well-marked types on the body and head of the mosquito.

These I have called by the following names:—

- (1) Narrow curved scales (*e*); (2) spindle-shaped curved scales (*f*); (3) upright forked scales (*h* and *i*); (4) spade-shaped scales or broad flat scales (*a*); (5) long twisted scales (*j*); (6) narrow hair-like curved scales (*d*).

Really all the scaly covering to the head, thorax, abdomen, palpi, and legs can be reduced to one of these six types. On the wings we get other modifications; the scales may be (1) linear and narrow; (2) elongated oval; (3) lanceolate; (4) pyriform (*k*); (5) spatulate; (6) or asymmetrically broadened (*b* and *c*).

The arrangement of the scales on the head in a typical *Culex* (Plate 3, fig. 2) is as follows: Narrow curved scales all over the occiput; upright forked ones, especially thick towards the nape, and flat ones on each side of the head. The thorax is more or less densely clothed with scales; in one type they are all narrow curved scales or hair-like or spindle-shaped scales on both the mesothorax and the

PLATE III.

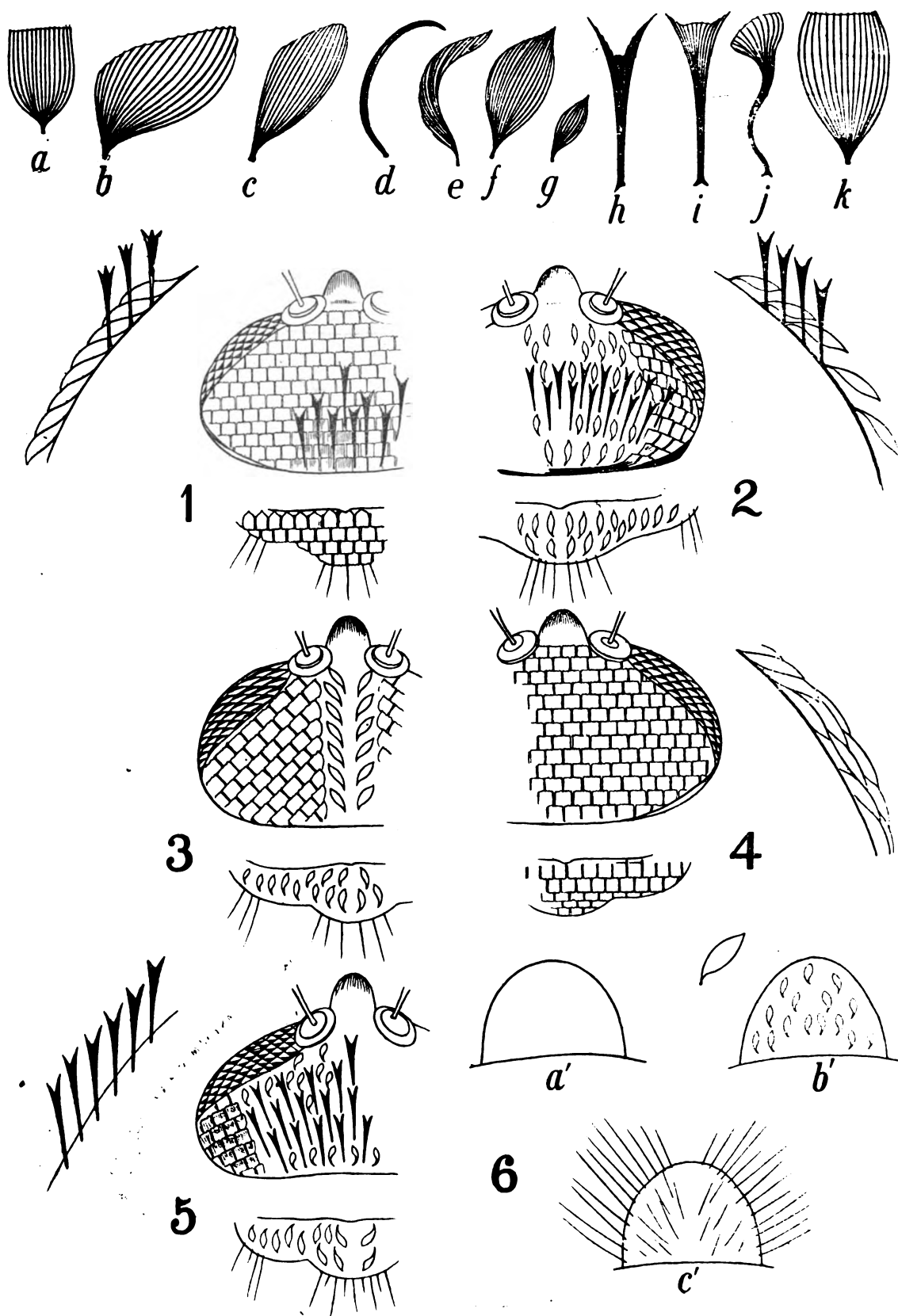


PLATE IV.

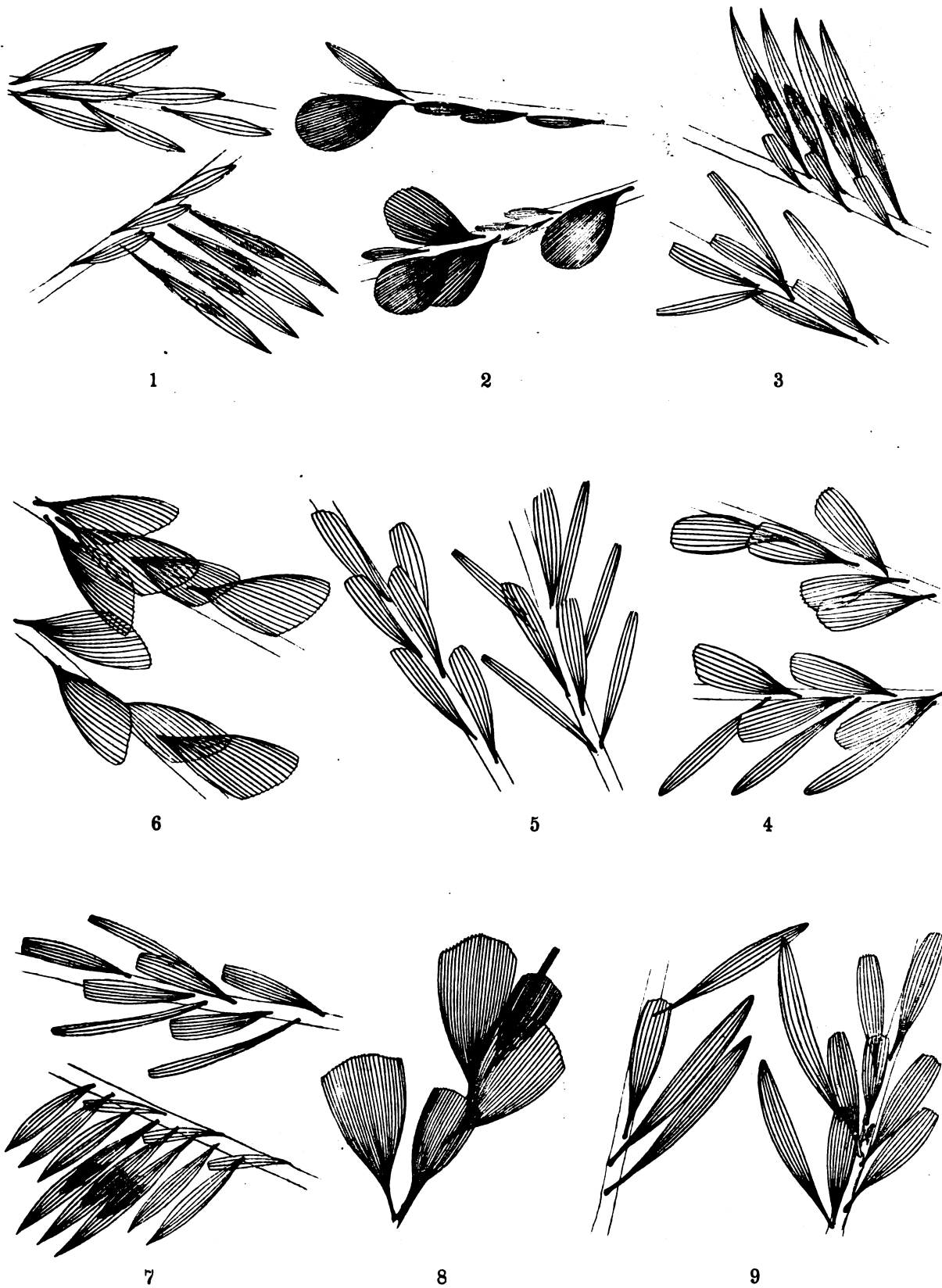
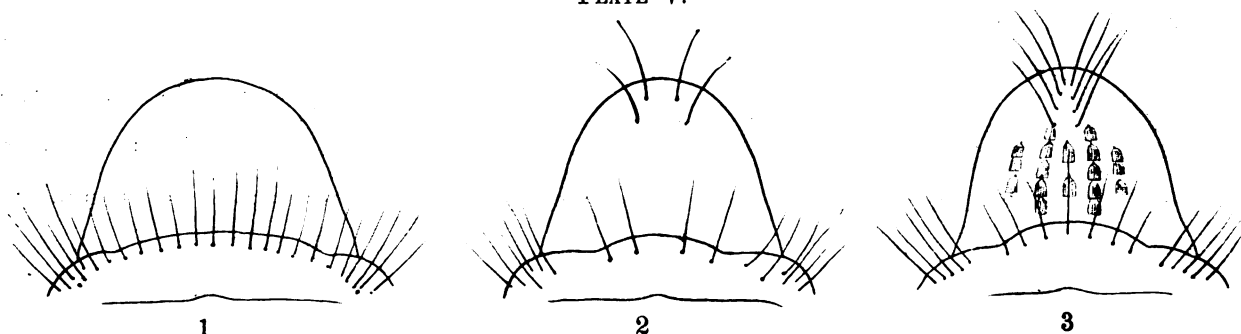


PLATE V.



scutellum; the metanotum is always nude in typical *Culex* and *Anopheles* (vide Plate 5). The legs are also completely covered with scales, which usually lie close together and overlap like the tiles on the roof of a house; they are normally small and spatulate in form and closely applied to the surface, but they may become elongated and erectile, or form dense tufts, giving the legs a thickened appearance (*Janthinosoma*), or even forming dense paddle-like patches (*Sabethes*).

The abdomen in most *Culicidæ*, save *Anopheles*, is covered with flat spatulate scales which form a complete covering. These offer little of systematic value, but in some genera the scales of the abdomen become rather elongated and erectile, and give the body a rough appearance (*Mucidus*), and in others certain parts may be densely scaled with long narrow scales forming a kind of caudal fan (*Megarhinus*, &c.).

On the wings we find scales of quite different form to those of the body. Each vein has two, three, four or more series of scales attached, which vary in form in the different genera. These scales are usually spoken of as (1) median vein scales, (2) lateral vein scales. In *Culex* the former are usually moderately broad, symmetrical, short or elongated scales ending convexly or flat, the lateral vein-scales in *Culex* are thin, linear, straight, or bent squamæ (Plate 4, fig. 7).

The wing fringe is composed of three or four sets of scales, the fringe-scales being long, of three sizes, and lanceolate, and along the border of the wing a third or fourth series of smaller scales, the border-scales of systematic value.

The genera first formed for *Culicidæ* were *Culex* and *Anopheles*, *Ædes* and *Corethra*. The genus *Culex* was instituted by Linnæus in 1790, and was apparently founded on *Culex pipiens*; *Anopheles* by Meigen in 1818, and also *Ædes* and *Corethra*.

In 1827 Robineau Desvoidy, in his "Essai sur les Culicidæ," instituted three new genera, *Megarhinus*, *Psorophora*, and *Sabethes*. Low, in 1844, placed *Mochlonyx* as a distinct genus.

Not until 1891 was any fresh tabulation of the family attempted. In that year Arribalzaga separated from *Culex* the genera *Janthinosoma*, *Tæniorhynchus*, *Ochlerotatus*, and *Heteronychia*; and from *Ædes* the genus *Uranotænia*. Another genus related to *Ædes* was formed by Williston, *Hæmogogus*, for a single St. Vincent species.

Of these genera I have retained *Culex*, *Anopheles*, *Megarhinus*, *Sabethes*, *Psorophora*, *Janthinosoma*,

Tæniorhynchus, *Uranotænia*, *Hæmogogus*, *Ædes*, *Corethra*, and *Mochlonyx*. But the characters of the genera have been somewhat modified.

The characters of the genera were mainly based on the proboscis and palpi, but into this old classification I need not now enter.

To these old genera I now add the following:—*Cyclolepteron*, *Toxorhynchites*, *Mucidus*, *Eretmapodites*, *Stegomyia*, *Armigeres*, *Deinocerites*, *Panoplites*, *Wyehmyia*, *Ædeomyia*, *Trichoprosopon*, and *Brachiosoma*.

The characters of these and the old genera are as follows:—

SECTION A.—Proboscis formed for suction; metanotum nude (Plate 5, fig. 1).

(a) Palpi long in the male.

Genus 1. *Anopheles* (Meigen).—Palpi long in both sexes, usually clubbed in the male. The head clothed almost entirely with large upright forked scales, a few narrow curved ones, and flat lateral ones (Plate 3, fig. 5). The thorax has usually narrow hair-like curved scales, but in some species they are spindle-shaped, the scutellum round or slightly trilobed with narrow curved scales, the abdomen usually nude of scales, but they may be present in the form of narrow spindle-shaped ones. The wing scales are rather long and lanceolate or narrowly spindle-shaped (Plate 4, fig. 1). The larvæ have no respiratory tube and lie horizontally in the water.

Genus 2. *Cyclolepteron* (Theobald).—Closely related to *Anopheles* and separated from it by the presence of deep inflated wing scales in patches, forming more or less black spots (Plate 4, fig. 2).

(b) Palpi long in male, shorter in female; first submarginal cell very small; proboscis bent (*Megarhinina*). Palpi five-jointed in female (*Megarhinus*); three-jointed in female (*Toxorhynchites*).

Genus 3. *Megarhinus* (Rob. Desvoidy).—Scales of the head are all arranged like tiles on a roof, flat (Plate 3, fig. 4); thorax with spindle-shaped and broad scales over the wings; scutellum with broad scales; caudal tuft present on last few apical abdominal segments. Larvæ large with respiratory tube.

Genus 4. *Toxorhynchites* (Theobald).—Venation and scale structure like the above, but the female palpi three-jointed and short.

(c) Palpi short in the female, long in the male; first fork-cell long (*Culicina*). In this group the

cross-veins and wing scales form the chief distinctive characters.

(d) Legs more or less densely scaled.

Genus 5. *Sabethes* (Rob. Desvoidy).—Mid cross-vein nearer apex of wing than supernumerary; posterior cross-vein nearer apex than middle. Legs with dense paddle-like areas of long scales.

Genus 6. *Janthinosoma* (Arribalzaga).—Cross-veins as in *Culex*; hind legs densely scaly; the scales on the thorax broadly spindle-shaped.

Genus 7. *Psorophora* (Rob. Desvoidy).—Posterior cross-vein nearer the base of wing than the mid cross-vein; wings with thin scales; legs densely scaled. Thorax with lines of small spindle-shaped scales.

Genus 8. *Mucidus* (Theobald).—Posterior cross-vein nearer apex of wing than mid.; wings with large pyriform and large spatulate scales, mostly parti-coloured (Plate 4, fig. 8). Thorax and head with long twisted upright scales giving a mouldy appearance (Plate 3, j).

Genus 9. *Eretmapodites* (Theobald).—Posterior cross-vein nearer base of wing than mid cross-vein; wings with rather long thick scales (Plate 4, fig. 4); legs in male with dense apical paddle. Scales of the head flat and also scutellum.

(e) Legs uniformly scaled with flat scales.

Genus 10. *Stegomyia* (Theobald).—Head and scutellum with flat scales; head with upright forked ones as well (Plate 3, fig. 1). Wing scales small, both spatulate and linear (Plate 4, fig. 5); fork-cells rather small. Palpi of male with more or less tufts of hairs. Larvæ with short respiratory siphon; eggs often laid separately.

Genus 11. *Armigeres* (Theobald).—Like above, but the male palpi rather long, thin and nude. Large species. Scales on head narrow and curved, upright forked ones, and broad flat lateral ones. Head and scutellum with narrow curved scales.

Genus 12. *Culex* (Linn.).—Wing scales small, lateral ones linear. Head and scutellum with scales as in Plate 3, fig. 2.

Genus 13. *Panoplitus* (Theobald).—Wing scales mostly broad and asymmetrical (Plate 4, fig. 6).

Genus 14. *Teniorhynchus* (Arribalzaga).—Wing scales dense, mostly elongate, oval, or broadly lanceolate.

Genus 15. *Deinocerites* (Theobald).—Second antennal joint very long, nude. In all the other *Culicina* it is rather small.

Genus 16. *Brachiosoma* (Theobald).—Second antennal joint long; the greater part of antennæ densely scaly.

(f) Palpi short in both sexes (*Ædeomyia*).

(g) Palpi two- or three-jointed, non-metallic.

Genus 17. *Ædeomyia* (Theobald).—Wing scales large and flat (Plate 3, c); fork-cells normal.

Genus 18. *Ædes* (Meigen).—Wing scales small, linear like *Culex*; fork-cells normal.

(h) Palpi five-jointed.

Genus 19. *Hæmagogus* (Williston).—Metallic; fork-cells normal.

(i) Palpi two-jointed.

Genus 20. *Uranotenia* (Arribalzaga).—Fork-cells very small; metallic; flat scales in spots on thorax.

SECTION B.—Proboscis formed for piercing; Metanotum with chætæ; palpi small.

Genus 21. *Wyeomyia* (Theobald).—Proboscis moderately or very long.

SECTION C.—Proboscis formed for piercing; metanotum with chætæ and scales.

Genus 22. *Trichoprosopon* (Theobald).—Palpi short in female; long in male.

SECTION D.—Proboscis short; not formed for piercing (*Corethrina*).

Genus 23. *Corethra* (Meigen).—Metatarsus longer than first tarsal joint.

Genus 24. *Mochlonyc* (Low).—Metatarsus shorter than first tarsal.

DESCRIPTION OF PLATES.

PLATE I.

TYPICAL PARTS OF MOSQUITO.

PLATE II.

WING OF CULEX.

c, costal vein; s.c, sub-costal; 1st to 6th, first to sixth longitudinal veins; a, a', and a'', incassations (a' called by Austen the 6th vein, a'' the 8th); y, supernumerary cross-vein; z, mid-cross vein; p, posterior cross-vein; A, costal cell; B, sub-costal cell; C, marginal cell; D, first sub-marginal cell; E, second sub-marginal cell; F., first posterior cell; G., second posterior cell; J, third posterior cell; K, anal cell; H, first basal cell; I, second basal cell; L, auxiliary; M, spurious cell.

PLATE III.

HEAD AND SCUTELLAR ORNAMENTATION IN CULICIDÆ.

(1) Head, scutellum, and lateral view of head scales in *Stegomyia* (Theo.).

(2) Head, &c., in *Culex* (Linn.).

(3) " *Ædes* (Meigen).

(4) " *Megarhinus* (R. Desv.).

(5) " *Anopheles* (Meigen).

(6) " Clypeus of a' *Culex*, b' *Stegomyia* (Theo.); and c' *Trichoprosopon* (Theo.).

a to k, Forms of Scales.

(a) Spade-shaped scale.

(b) Broad asymmetrical winged scale of *Panoplitus* (Theo.).

(c) The same of *Ædeomyia* (Theo.).

(d) Curved hair-like scale.

(e) Narrow curved scale.

(f) Spindle-shaped scale.

(g) Small spindle-shaped scale.

(h) and (i) Upright forked scale.

(j) Upright twisted scale.

(k) Inflated parti-coloured scale.

PLATE IV.

FORMS OF WING SCALES.

(1) *Anopheles* (Meigen) vein and fringe scales.

(2) *Cyclolepteron* (Theobald) vein scales.

(3) *Janthinosoma* (Arribalzaga) vein and fringe scales.

(4) *Eretmapodites* (Theobald) vein scales.

(5) *Stegomyia* (Theobald) vein scales.

(6) *Panoplitus* (Theobald) vein scales.

(7) *Culex* (Linnaeus) vein and fringe scales.

(8) *Mucidus* (Theobald) vein scales.

(9) *Psorophora* (Rob. Desvoidy) vein and fringe scales.

PLATE V.

TYPES OF METANOTUM.

(1) *Culex*.

(2) *Wyeomyia*.

(3) *Trichoprosopon*.

NOTES ON CASES OF "SLEEPING SICKNESS" OCCURRING IN THE UGANDA PROTECTORATE.

By J. HOWARD COOK, M.S., M.B.Lond., F.R.C.S.Eng.
C.M.S. Mission Hospital, Mengo, Uganda.

With preliminary note

By PATRICK MANSON, C.M.G., F.R.S., LL.D.

To the Editors of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIRS,—In sending you an important paper by Dr. T. Howard Cook, on "Sleeping Sickness in the Uganda Protectorate," I would ask you to request your readers in Tropical East Africa to use their opportunities to settle the question of the geographical range of this terrible disease in that part of the world, and, at the same time, to avail themselves of what appears to be a unique chance of ascertaining whether this disease is or is not caused by *filaria perstans*.

It is definitely known that sleeping sickness has existed at least from the beginning of last century in West Africa. Apparently until quite lately the area of its distribution was limited. For some time, however, missionaries and others concur in asserting that it is extending to districts hitherto immune, and that this extension is proceeding along the new trade routes which are being rapidly opened out by Europeans. Dr. Sims, of Stanley Pool, informs me that whereas formerly sleeping sickness was unknown at this part of the Congo, it is now extremely prevalent there, and moreover, that within his recollection it has become epidemic in the densely populated valley of the Bangala, a thousand miles up the Congo. He and others tell me that it occurs sporadically as high up the great river as Stanley Falls, where formerly it was unknown. This extension on the Congo is believed to have been brought about by the revolution in travel and multiplication of opportunities of communication entailed by the substitution of steamers for canoes.

Dr. Daniels has told us that he heard of the disease near the south end of Lake Tanganyika, a feeder of the Congo, and he mentions the significant fact that he found *filaria perstans* in a native of that district; whereas, in the many examinations he made of natives of the Shire and Zambesi basins he neither heard of sleeping sickness nor did he once encounter *filaria perstans*. I have found *filaria perstans* in many blood films from natives of the Congo basin living at various places on the river at least one thousand miles from its mouth. I have never seen this parasite in a considerable number of blood examinations of natives from tropical East Africa, nor until I read Dr. Cook's paper, had I heard of its occurring in the Nile Basin, or in fact in any part of the eastern watershed of the African continent.

Now it would appear that both sleeping sickness and *filaria perstans* have shown themselves on the head waters of the Nile and it becomes, considering the deadly character and marked tendency of this disease to spread, a matter of state importance as well as of pathological interest to ascertain if the disease and the parasite, having jumped the watershed, are travelling eastward in company. It may be that, like the jigger, they will over-run East Africa and possibly extend to India and the East. These, and similar problems in the influence of extending communication, the geographical distribution of disease, are of practical as well as of intense pathological interest.

If in this matter, we would watch with profit the progress of events, it is desirable that the present condition of the natives of East Africa as regards *filaria perstans* be definitely settled before the sleeping sickness has spread further. If we find that the parasite is absent in districts to which it subsequently spreads concurrently with, or somewhat in advance of, sleeping sickness we will be in possession of a strong argument for regarding the two in the light of cause and effect.

I would therefore request all medical men in those regions

to make systematic examinations of the blood of the natives for *filaria perstans* and to report the result. Should opportunities for microscopical work be wanting the London School of Tropical Medicine would undertake the examination of any blood films forwarded to it. All that is necessary to secure suitable films is to spread a large drop of blood on an ordinary microscope slip, allow it to dry and then forward it with others in an insect proof and dry box. Fifty or a hundred such films from as many natives would be sufficient to enable us to determine the presence or absence of the filaria in any given district.

Yours faithfully,

July 8, 1901.

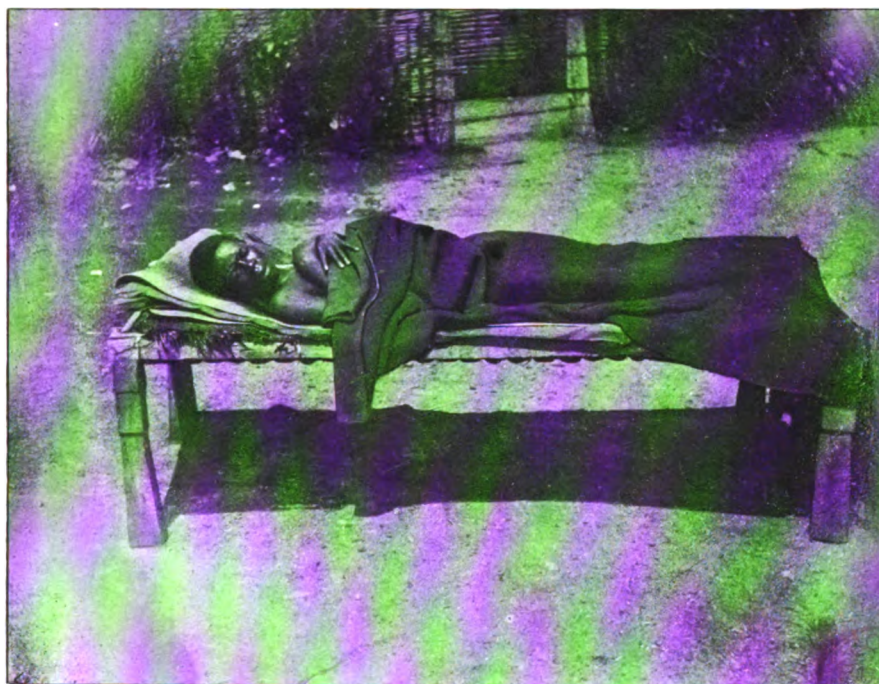
PATRICK MANSON.

It is now nearly five years since this Hospital was first built and medical missionary work first started in this Protectorate; but until four months ago we had never met with a case of so-called "Sleeping Sickness," or "Negro Lethargy." As this disease is so terribly fatal, so little known except on the West coast of Africa, and its causation at present far from definitely ascertained, the following brief notes may not be out of place as coming from a district where apparently the disease is only just making its appearance. The Mission Hospital contains 66 beds and has a daily dispensary attendance ranging between 150 and 200 patients, chiefly Baganda, but also other races, such as the Bayima, Banyoro, and occasionally Indians and Nubians. Until the present year we had never even heard of the disease as existing amongst the natives here, and were only familiar with it from text-book descriptions. During the last two months no less than seven, with a doubtful eighth case, have come for treatment suffering from this complaint. The natives tell us that the disease is much more frequent in Busoga than in Buganda, and of our eight cases four came from that country: but we have never heard of any widespread epidemic as occurring in this part of the world. We were able to obtain specimens of the blood of seven of the patients, and in five of these the *filaria perstans* were easily found in the field of blood submitted to the microscope, the other two cases though repeatedly examined both by day and night did not reveal any worm in the peripheral circulation, though I should be loth to hold that they were absent from the circulation; they were at least not so conspicuous in the peripheral circuit, although as will be seen below, the cases submitted to examination were clinically most typical cases of sleeping sickness. But I have observed that the facility with which the worms are found in any one case often varies from day to day, and there is apparently no relation between the condition of drowsiness and the facility with which the filaria is discovered in the peripheral circulation. The Baganda have no name for this disease but merely use the word "kubongota" which means "to nod," or "to be drowsy"; the Basoga, however, have a special name for the disease which they call "Kibongoya," possibly a substantive derived from a verb akin to the Luganda "kubongota." So far from the disease being accompanied by any loss of appetite, one of the natives told me that they diagnosed the onset of the disease by the amount of food ("emere") which the patient consumed. For the notes on Case 1 I am indebted to my brother, Dr. Albert Cook, who also performed the *post-mortem* examination, and who first



SLEEPING SICKNESS.

Photograph, illustrating Case 2, described in Dr. J. HOWARD COOK's article on "Sleeping Sickness in Uganda."



SLEEPING SICKNESS.

Photograph, illustrating Case 3, described in Dr. J. HOWARD COOK's article on "Sleeping Sickness in Uganda." Photograph taken two days before death.

pointed out to me the presence and characteristics of the worm in our first two cases.

CASE 1.—Alibayagade. Girl, aged about 11 years. Her home is at Lugumba's on the heights above the lake Victoria Nyanza. She has never been to Busoga, but has lived at Lugumba's all her life. She has suffered from repeated attacks of "fever," measles, "nsundo" (probably generalised warts), chicken-pox, mumps, and smallpox. There is no history of syphilis. Father and mother are living; one brother died, cause unknown. The illness of sleeping-sickness is stated to be unknown in the district from which she comes. Patient was admitted to the Hospital on February 13, 1901. The following are abstracted from the daily notes taken in Hospital:—

H.P.I.—Two months ago she was found by her friend to be ill, shivering and shaking, staggering when attempting to walk, being at all times very drowsy and sleeping most of the day. She was stated to have been ill only one month before her friend arrived.

February 16.—Specimens of blood taken at 8.30 a.m., 10.30 a.m., 2 p.m., 5.30 p.m., 8.30 p.m., all show the presence of filaria in the blood, the worm showing the following characteristics: It is freely contractile and moves not only on its own axis, but in a time travels through eight to ten fields of the microscope (under a high power); it has a fine whip-like tongue though this is difficult to see; stained specimens show that it possesses no V-spot; its length is fifteen to twenty times the diameter of a red blood corpuscle; its breadth about one-third the diameter of a red blood corpuscle; its tail tapers; the body contents are granular and stain deeply with methylene blue.

N.B.—On February 14 fever parasite of the æstivo-autumnal type were present in the blood.

March 1.—For the last fortnight the patient had been in an intensely drowsy condition. Sleeps all day and night long (though the actual amount of true sleep was not measured). Can be roused to take her food. If sat up sits for a long time in that position. Feels the prick of a needle. Passes her water under her but knows when she wants to defæcate.

March 5.—Is growing emaciated, cannot stand. Has considerable paresis of limbs. When eating raises the food to her lips in jerks, sometimes not reaching her mouth. Chews very slowly and mechanically. Sits up with marked kyphosis.

March 7.—Patient is quite conscious but apathetic. She passed a motion under her for the first time to-day.

March 8.—Marked retraction of the head noticed for first time. Lies on the right side; grunts from time to time. Slight nystagmus noticed. No vomiting; bowels costive. Passes much water by day and night under her. Constantly swallowing saliva. Rather, but not very anæmic. No jaundice. Pupils pin-point equal; vision normal. Whole surface of body cold and clammy. Axillary temperature 94°. Chest barrel-shaped. H.A.B. and C.D. not obtained. Abdomen rigid; no ascites; liver and spleen not felt. Sensation apparently poor at extremities, can feel all over proximal part of limbs (loss of sensation is probably due to coldness of collapse). Knee-jerk not obtained; limbs slightly rigid.

Urine as drawn off by catheter, alkaline, cloud of albumen. Pupils insensitive to light. Temperature, irregular course, never over 101°.

Patient died at 5.30 p.m., March 8. *Post mortem* 7.30 p.m. Body not yet in condition of rigor mortis.

Brain: dura mater slightly adherent in middle line; vessels on dura mater and pia mater not congested; half a fluid ounce of cerebro-spinal fluid at the base of brain. Pituitary body enlarged, but sections were not taken.

Lungs: nil abnormal, no fluid in pleuræ; lungs overlapped the heart more than normal.

Heart muscle flabby, organ otherwise normal.

Body fairly well nourished.

Liver: normal.

Spleen: slightly enlarged, otherwise normal.

Bowels: two ascarides lumbricoides found dead in bowel.

About 1½ oz. of fluid found in Douglas' pouch.

During life out of thirteen blood films taken in the "fresh state" the filaria was absent in only one specimen.

CASE 2.—Nasanieri Seputimba. Man, aged about 25 years. Had been a teacher, and was well known in this place as a bright and intelligent man. Was quite well up to three years ago, when he went to Busoga and there contracted his present disease. He describes the onset of his complaint as accompanied by pains in chest and neck, and a chronic cough. To his friends his illness first revealed itself as a gradually increasing drowsiness, rendering his attendance at classes impossible. He has lately lost flesh and become much weaker. Has had comparatively little fever, and no venereal diseases. Had small-pox in infancy. He was admitted to hospital on February 11. The following are taken from notes made on admission:—

General aspect of patient that of listless lassitude; he is so drowsy that one has to ask the same question two or three times over to get a reply, but when given it is consistent and intelligent; he has lost flesh, is pale in the face, and somewhat puffy about the eyes; has a slight cough and expectorates a little mucous, but has never had any hæmoptysis; pulse 128, regular in force and frequency, tension and volume normal; respiration 28, shallow; temperature 99°; bowels costive; tongue moist and furred; throat normal; conjunctiva anæmic; no jaundice; voice is mumbling and indistinct, as if there were a potato in the mouth; feet not swollen; skin is harsh and dry; heart and lungs both normal; spleen and liver are not felt to be enlarged.

February 13.—Patient has an excellent appetite, but complains of pain in chest. Temperature remains normal. Mouth is in a foul state and saliva may now and then be seen dribbling from mouth.

February 14.—5.30 p.m. *Filaria perstans* found in blood.

February 15.—Ditto at 9 a.m.

February 24.—Patient has a very staggering gait; while walking in the ward he staggered and fell down.

March 3.—Patient is growing very stout. Normally a nice-minded man, to-day he passed his water into his bed in the middle of the Hospital Service; knows that he did so, but evinces no sense of shame.

March 30.—Patient is growing much weaker. He passes both urine and faeces under him, and has had to be moved into the septic ward. Breath very offensive. More drowsy. Marked tremors in limbs. Pulse, however, excellent in quality, and only 100. Temperature has run an irregular course, but never been over 101°.

April 5.—Tongue very tremulous. Speech thick and indistinct. Anæmia less marked under treatment. Patient complains bitterly of cold at night.

April 10.—Pain is complained of specially in legs and thighs; muscles are obviously tender.

May 3.—Tremors are markedly increasing; pain in limbs better. Urine: colour and odour normal. Sp. gr. 1025. Alkalide on passing. No albumen or sugar. Deposit of phosphates, mucus in suspension.

Knee-jerks are absent. Ankle clonus easily obtained; in spite of absence of knee-jerk skin is very coarse and covered with white lines from scratching. Pupils react to light and to accommodation. Ophthalmoscopic examination reveals a normal fundus and clear media. There is an enlarged gland at the left angle of jaw, and along both sides of neck down the posterior border of sterno-mastoid muscle. Tactile sensation everywhere normal.

May 9.—Patient is obviously slowly sinking. Repeated examinations of blood taken from the finger have lately failed to show the presence of the filaria that was so easily demonstrated at first.

CASE 3.—Sedulaka. Man, about 30 years. Comes from Kyagwe; has never been in Busoga. No other cases of sleeping sickness known in his native place, but he has been to Ngogwe, where other cases have been found. His home is near a marshy river. Admitted to hospital April 20, 1901. He was quite well up to the beginning of March of this year. He too, like the last case was a teacher, and if anything above the average intelligence. He describes his illness as originating in a sense of giddiness. He had long-continued hiccough, and was soon noticed to have a staggering gait. No special excess of appetite. No attack of mania or epilepsy. He has not suffered particularly from fever.

P.S. April 20.—Patient has the aspect of lethargy and drowsiness. He answers slowly when spoken to, and speech is indistinct. Tongue is very tremulous, pale and thinly furred. Conjunctiva pale; no jaundice. Pulse 76, regular in force and frequency, medium tension, volume full, moves very slowly, like his speech. Temperature 100·8°. No respiratory symptoms; lungs normal. Heart quite normal. Spleen and liver cannot be felt. On examination of blood both by day and night *filaria perstans* was found in every specimen examined. Sometimes as many as two worms were found in a single field. They retained their vitality and movements for some hours, but in that time had moved some distance from their original position.

April 23.—Patient found passing urine into his bed openly. Skin harsh and dry, irritable, but has not many scratch marks. Glands felt in both posterior triangles of neck.

May 2.—Tongue very foul and furred; bowels costive. Lips covered with sordes. Lids droopy. Fine tremors of hands.

Urine: normal colour and odour; reaction neutral; deposits phosphates and urinary epithelium; specific gravity, 1·015; slight trace of albumen; no sugar.

Knee-jerks absent; no ankle clonus. Tactile sense normal.

May 8.—Up till yesterday patient had had a practically normal temperature, but to-day there is a sudden exacerbation up to 106, and patient is quite unconscious, with deeply stertorous breathing. He died at 11 p.m.

Ophthalmoscopic examination yesterday showed clear media and normal optic discs; fundus normal, except for a glistening appearance of the macula (? due to hypermetropia), which was present.

Autopsy, May 9, nine hours after death rigor mortis well-marked.

Brain: dura and pia mater normal; membranes not unduly adherent; vessels at base of brain dissected out and found normal; there was about 1½ oz. of cerebro-spinal fluid at base of brain; the pituitary body measured ¾ in. in its longest diameter, from where it left the base of third ventricle to the anterior extremity of the anterior lobe; from side to side the greatest measurement was ¾ in.; from front of anterior lobe to back of posterior lobe was ¾ in.; the organ was of a congested red colour; it was preserved in strong spirit to be sent to England for examination; the rest of the brain appeared to the naked eye quite normal, as examined in the usual way by sections (macroscopic).

Heart and lungs quite normal; no fluid in the pleural cavity.

Stomach, duodenum, and small and large intestine normal.

Spleen and liver unduly soft, not enlarged.

Kidneys normal; suprarenal capsules small and fatty.

Pancreas normal.

Spinal cord not examined.

CASE 4.—Musibike. Girl, aged about 10 years. Admitted to hospital April 25. Patient taken ill six months ago. Her friends describe the onset of the illness as falling into "dalu," a native term used rather vaguely to denote either mania or fits, epileptic or otherwise. On recovery from this patient was noticed to be becoming increasingly drowsy. She has never been out of Buganda, though she has been to the district of Kyagwe, where there are similar cases as alluded to above. Child is very drowsy and can hardly be roused; she will, however, answer rationally when roused. Skin coarse, dry and irritating. Pulse 80, good quality. Respiration 18. Temperature normal. Tongue moist with a thin fur. Not particularly anæmic. Conjunctiva normal. No respiratory symptoms. *Filaria perstans* found in every specimen of blood examined.

April 27.—Small glands felt in both sides of the neck. Skin covered with white scratch marks. Spleen and liver not enlarged. Heart and lungs quite normal. Urine not examined. Patient freely passes the urine into her bed. Ophthalmoscopic examination not yet made.

May 9.—Patient still in hospital, and is in same state as when last note was made.

CASE 5.—Mwavu. Boy, aged about 9. Admitted

to the hospital May 4, 1901. Child was taken ill a month ago with gradually increasing drowsiness. No maniacal attack. He has a noticeably large appetite. He comes from Wakoli's, in Busoga, but says there are no other cases of illness like his own near his home, and his friends corroborate the statement. He is seen to be always scratching his skin, which is rough and covered with the white scratch marks. Cervical glands just felt to be enlarged on both sides of the neck, along the sterno-mastoid muscle; sub-maxillary lymph glands not enlarged. Tongue slightly furred and markedly tremulous. The child is so somnolent that he will fall asleep sitting as one is talking to him, and a sustained examination is impossible. Conjunctiva normal; pupils react both to light and to accommodation, though sluggishly. He lies curled up in bed. Is stated to have suffered recently from a copious dribbling of saliva from his mouth.

Knee-jerks are both markedly brisk, and ankle clonus is easily obtained both sides.

Heart and lungs both normal; liver and spleen not felt.

Urine: specific gravity 1015, pale in colour, but odour normal; markedly alkaline when passed; no albumen nor sugar; deposit of phosphates.

The blood of this patient has been repeatedly examined for *filaria perstans*, but no worm has yet been detected in the peripheral circulation.

CASE 6.—Byaketa. Man, aged about 45. Admitted to the hospital May 9, 1901. Patient comes from Bu'si, but states that he contracted the disease in Nandi country (about lat. 0, long. 35 E.), whither he went amongst a number of porters two years ago. No one else in his caravan contracted the disease. Onset of the illness was gradual. He states that he first fell ill of fever and then noticed that his walk was unsteady, and after that an unconquerable lethargy and drowsiness overcame him. Patient does not seem to be particularly drowsy, and responds to questions without hesitation, though slowly, and occasionally yawning. He seems intelligent and so little has the aspect of sleeping sickness that when his blood was examined it was a surprise to find the *filaria perstans* in the first specimen of blood examined. However, his skin was conspicuously rough and coarse, and covered with scratch marks. Cervical glands distinctly enlarged. Tongue furred and moist. He staggers in his walk. There is no salivary flow, though patient states he occasionally suffers from this symptom. There is no history of mania or vertigo. Pulse regular in force and rhythm; excellent quality. Appetite not abnormal.

CASE 7.—Mufumbiro. Woman, aged about 50 years. Comes from Ngogwe, Kyagwe, but contracted her illness in Busoga. Admitted to hospital on March 14, 1901. Her neighbours noticed that she was very apathetic, and told her that she was suffering from sleeping sickness. She does not appear to be very drowsy. Repeated examinations of the blood have failed to show the presence of the *filaria* in the peripheral circulation. Under treatment she became brighter and less apathetic. The skin is harsh and irritable and patient is always scratching herself.

April 11.—Patient is fat and well-nourished. No

jaundice. Tongue clean. Rather anæmic. Heart and lungs normal. Liver and spleen not enlarged. No ascites. The attendant doubts the drowsiness. Habits unclean; passes water into bed.

CASE 8.—Name not known. Patient was only seen on an itineration when any detailed examination was impossible; but the following points were noted: Illness stated to date from three months ago. Contracted in the Nandi country east of Busoga. Onset very gradual, and stated to be merely increasing lethargy and drowsiness. Patient could then be roused with difficulty. Speech was slow, hesitating, and indistinct. Patient anæmic. Pupils small and react sluggishly to light and accommodation. Gait staggering, and patient would have fallen but for help. Skin was harsh and covered with scratch marks.

No examination of blood was possible, neither was any note taken as to condition of cervical glands. The general aspect of patient was undoubtedly that of sleeping sickness. Attempts to trace the further history of this patient proved unsuccessful. Patient was a middle-aged man.

Reviewing the above series, we see that two were girls, two were young men, one a boy, two middle-aged men, and one an elderly woman. Of the seven cases where a blood examination was obtained *filaria* was easily demonstrated in five, while in two it could not be found after a fairly thorough, though, doubtless, not exhaustive search; yet the fact remains that it is easier to find the worm in some cases than in others, and in the same case the facility of finding the worm in the peripheral circulation seems to vary from time to time. Again, I think it is noteworthy that we have never heard of any wide-spread epidemic of the disease in this part of Africa, and our patients have generally denied the existence of other cases in their neighbourhood. Of our series, two contracted the disease indubitably in Busoga, two on a journey that led through Busoga to Nandi, whilst four have never been out of Buganda. A maniacal onset occurred only in one case. With regard to treatment we have tried arsenic, tonics, and quinine, but without the slightest apparent benefit. The course of the disease in the two fatal cases was three and two and a half months respectively, but Case 2, Nasanieri Seputimba, who cannot be far from his end now, has lasted three years. So far we have been quite unable to arrive at any definite conclusion as to the cause, unless as Manson suggests it is the *filaria perstans* which has been found in so large a proportion of the cases examined in localities so widely differing climatologically and geographically as Uganda and the West Coast of Africa. Again, one finds it hard to see why one form of *filaria* should produce so peculiar a condition as elephantiasis and another species so widely different a condition as sleeping-sickness. That we shall soon have more abundant material to study seems unfortunately more than a mere probability.

A CASE OF MULTIPLE ABSCESES OF THE LIVER.

By W. E. DE KORTE, M.B.Lond.

Midland Hospital, Graaff Reinet, Cape Colony.

J. L., a Polish Jew, aged 35, came to the hospital with a history of dyspepsia of four years' duration. He had been losing condition lately, was unable to take his food, and slept badly. He complained of a band of fulness extending somewhat to the right at the pit of the stomach. He had had dysentery four years previously, from which time he dates the commencement of his illness. He had also suffered from malaria in Mashonaland prior to this, and was treated during his illness for fever and for syphilis; this information was imparted by his doctor. As evidence of syphilis, he had several dark pigmented spots on his right shin-bone.

On admission, there was slight fulness of the right hypochondriac region, temperature 101 degrees F. After a week's observation, the swelling in the hypochondriac region becoming more marked, an aspirating needle was run into the tumour and some dark chocolate-coloured fluid withdrawn. Placed under the microscope, this fluid was seen to contain pus cells, many micro-organisms, and a number of amœbæ coli; that the bacteria of pus were also present would at least seem highly probable. It was decided to operate by two stages, after the method adopted by Mr. Godlee. The patient having been placed under chloroform, a vertical incision, three inches long, was made midway between the two borders of the right rectus muscle, about one and a half inches below the margin of the ribs and the liver exposed. The surface of the liver was quite smooth, and as far as could be felt there were no adhesions. In the act of placing the outer circle of interrupted sutures, the needle, a small fully-curved Hagedorn, practically opened the abscess. The liver substance now bulged out of the wound to an extent of fully two inches beyond the level of the abdomen. Here was a dilemma. If an attempt had been made to place sponges so as to prevent the escape of fluid into the peritoneal cavity, the liver would have been forced away from the wound. A considerable quantity of pus, &c., would inevitably have reached the peritoneal cavity before a sufficient number of sponges could have been so placed as to effectually prevent this contingency. The wound in the liver was enlarged and the parietes pressed against the protruding liver. The pus now fairly squirted out, and though no measurement of the quantity was taken, at least four pints must have escaped. A large drainage tube was inserted into the abscess cavity and the wound dressed. The patient recovered well from the operation and was not sick. Some dark blood oozed from the wound in the afternoon, and the dressing was deeply bile-stained on the following morning.

Two days later the discharge was more purulent. The patient slept well, but complained of pain along the lower dorsal spine. For eight days in all, his temperature remained normal night and morning. The wound looked healthy. Patient took his food

well, but his pulse was quick and soft; rate, 120 per minute.

Fifteen days after the operation, discharge thick and fully purulent, and very variable in quantity. Pulse 140. Temperature 101·4 degrees in the evening. Right hypochondriac region is scaphoid and looks like the left side. Patient now began to lose ground. Hectic fever supervened and it became evident that either the wound did not drain, that the necrotic process was extending in the liver, or what seemed more probable, that there was another abscess.

Twenty-three days after the first operation the patient was placed under A.C.E.; a probe passed along the drainage tract, and a counter-opening made in the line of the posterior axillary fold. The wound was flushed twice daily with a hot creolin solution. For a few days the discharge was bile-stained and turned the iodoform gauze black. Hectic fever continued.

Five days later the abdomen suddenly became tense, hiccough, flatulence, and sour eructations troubled the patient. The hepatic dulness, which began immediately below the right nipple, had now migrated to the seventh intercostal space, there was some dulness at the base of the right lung behind and a short cough worried the patient. There have been no rigors. The patient gradually became weaker and died a month after the performance of the first operation.

Post mortem.—Liver considerably enlarged. Peritoncum adherent about operation wound, no other adhesions of the convexity. Occupying the posterior surface of right lobe was a large abscess, which had opened into the peritoneal cavity, but was confined by some adhesions and the colon below. This abscess communicated with the original one at its lower and posterior part. All that was left of the original abscess was represented by the drainage tract. The other portions of the liver were riddled with abscesses ranging in size from a walnut to that of a large orange. The matter in these abscesses was a lemon colour and of the consistency of laudable pus; that found in the original abscess of a dark chocolate colour and of a watery consistence. The diminution of the hepatic dulness in front and its persistence behind for some while after the first abscess had shrunk, was due to the rupture and subsidence of the posterior abscess into its new abode in the peritoneal cavity. The patient was known to have contracted syphilis, but what part this disease played in modifying the evolution of the case is difficult to say. For although it is possible that some of the smaller abscesses were breaking down gummatous, the majority were too large to admit of this explanation. At the time of operating no irregularities were felt on the surface of the liver, yet at the *post mortem* some of these abscesses caused projections close to the operation wound; this would indicate that these abscesses formed subsequently to the operation, and indeed it would be hard to imagine that the patient could have lived long after the formation of these secondary (?) abscesses; so numerous were they.

The following seem to be some points of interest in this case:—

(1) The long period of four years that the patient had symptoms, which were considered to be chiefly dyspeptic.

(2) Attacks of pyrexia during this period which were diagnosed as eruptions of malarial fever.

(3) The absence of sweating and rigors.

(4) The considerable time that elapsed between the attack of dysentery—four years—and the time when an abscess undoubtedly existed.

(5) The very rapid development of the abscess towards the end. It became distinctly visible, bulging out the right hypochondriac region in about seven days.

(6) The impossibility, that is when the capsule is not thickened, of sewing the visceral peritoneum to the wound, and the danger of trying to include the liver substance in the suture, when an abscess is superficial.

(7) The fact that though unavoidably no precautions were taken to prevent the contents of the abscess from reaching the peritoneal cavity, no infection occurred.

This piece of good fortune may be explained in one of two ways. Firstly, that the abscess contents were sterile—from the microscopical examination of the pus aspirated this would seem very unlikely. Secondly, that the parietal peritoneum acted as a valve-like collar and firmly closed on the protruded liver substance. The factors favouring this action would be the tension in the abscess, causing it to bulge into the abdominal wound; this protrusion would be greatly assisted by the elastic pressure of the thoracic and abdominal viscera, and the more the tension in the abscess fell, owing to the escape of its contents, the more effectually the elastic pressure of the abdominal viscera would thrust the liver into the abdominal wound, this being the only spot where escape is possible and at which there is no reaction.

Now the edges of the abdominal wound and underlying peritoneum being comparatively rigid, the soft liver substance would be moulded into the wound and forced taut against its under surface, somewhat after the manner that a rent in the outer covering of a pneumatic tyre would nip the inflated inner tube protruding through a rent in its wall.

(8) There was no evidence of syphilitic perihepatitis or cirrhosis.

(9) It would be of great interest to know the relation of the multiple abscesses to the original one. From the colour of the pus, &c., it would seem probable that these abscesses were of comparatively recent formation. Did they form subsequently to the performance of the first operation? Were they secondary to the first abscess and derived by metastasis, or did the foci of infection lie dormant, being kept, as it were, in abeyance by the activity of the first abscess, and the altered circulation in the liver, which the presence of so large a tumour as the first abscess in its substance, was bound to have induced? The absence of rigors would suggest that these abscesses were not metastatic or pyæmic.

(10) If the opening of an hepatic abscess is done in two stages, it would be wiser for a beginner not to attempt Mr. Godlee's method of stitching, but

merely to place some gauze in the wound, and to rely upon this along with firm pressure to affect adhesions.

BATH AS A HEALTH RESORT FOR TROPICAL PATIENTS.

By CHARLES BEGG, M.B., C.M. Edin.

BATH, justly celebrated as possessing the only truly thermal spring in Britain, has been further favoured by nature in its climate, its sheltered position, and its beautiful surrounding scenery. One writer, Dr. Spender, says of it: "A rival the city can never have in its situation, beauty, salubrity, and shelter—to say nothing of its many social privileges." It is thus an ideal refuge for those who have broken down in the tropics and are forced to return home to re-establish their health.

Bath lies in a bend of the valley of the Avon, has sloping ground with every possible aspect, but is only exposed to the west; the slopes facing the south and south-west being most built on. The elevation varies from 60 feet on the river bank to about 550 on either side, mean elevation being 285 above sea-level; while Lansdown, outside the northern boundary, rises to 750 feet. The ground being sloping, the nature of the subsoil is not of such vital importance, but few residential areas can offer such a variety of subsoils as are to be found in Bath. The corrected death-rate for the year 1900 was 15·24 per 1,000. The water supply is exceptionally good and is obtained from numerous springs. The water is *hard* and free from organised or unorganised impurities. The *hard* character of the water suggests its value in cases of chronic diarrhœa.

Relative humidity.—Bath has been said to be exceptionally moist, but statistics prove that of sixteen towns, only two are 1 per cent. less; London and Llandudno being 76, Bath 77. All the others are higher; Torquay and Lowestoft heading the list with 87 during 1900.

In dealing with the questions of atmospheric pressure, sunshine, and wind force, an excellent case can be made out for Bath in comparison to other places. The hours of bright sunshine in 1900 were 1503·2. The mean temperature for the year was 50·4 degrees; for October, 50·8 degrees; November, 46·4 degrees; December, 46 degrees. February was the coldest month with 33·8 degrees; February 23 was the coldest day, when the absolute minimum was 16·8 degrees, and July 19 the hottest, at 89 degrees. The Rev. Leonard Blomefield gives the following table taken during a period of eleven years:—

		Mean.		Highest.		Lowest.		Range.
Spring	..	48·4	..	51·2	..	45·8	..	5·4
Summer	..	60·3	..	63·5	..	58·1	..	5·4
Autumn	..	50·7	..	52·3	..	48·5	..	3·8
Winter	..	41·4	..	46·3	..	36·4	..	9·9

Rain fell during 169 days, but only during nine weeks of the year did a rainfall of over 1 inch occur. Total for year, 30·79 inches; mean fall for thirty-five years, 31 inches.

Quality of the air.—In extreme summer weather

Blomefield says: "There may exist a difference as to the quality of the air in Bath and in the surrounding hills, but Bath is not a manufacturing city, therefore the ozone present is not destroyed by smoke and other impurities; but the cooler breezes of the downs on the north and south sides of the city abound in ozone." He also adds that the statement circulated a century ago by Heberer that Bath is relaxing is now recognised as traditional and not existing in fact.

I am indebted to the report of Dr. Symons, Medical Officer of Health, for many of the above facts, a consideration of which cannot fail to impress us with Bath's desirability for our purpose. Residences can be fixed at any desired level, and patients can either be protected from the wind while exposed to the sunlight by residing in the sheltered lower levels, or, still, obtaining the advantages of all the sunlight going, can reside on the slopes at any desired altitude quite protected from the harsher winds. A great deal has been written in favour of bracing and stimulating health resorts, but experience shows that much of it will have to be rewritten. It is a great question how far it is wise to send a patient who is below par to a place which tempts him to spend quickly the small balance of reserve force left to him. The question is intimately related to the use of medicinal or other stimulants at the bedside. It too often proves his undoing and proves to be the last straw. A time arrives when such places have their decided use, but of far greater value in the majority of cases are those places where the dormant energy of the patient is not unduly stimulated, where, encouraged by largely natural surroundings, bathed in sunshine, protected from the colder winds, he can build up the reserve force instead of spending it. Most of our tropical patients come under this class, and need all the shelter and sunlight they can get. They have become specially susceptible to cold, and are unable to stand exposure to our east wind. This practical aspect of the question has been discovered by the public for themselves, and a large number of the residents of Bath are men retired from the East. Before death claims them the average age is so well past the traditional allotted "three-score-years-and-ten" as to be most noticeable. On account of Bath's sheltered position it has acquired the reputation of being *relaxing*. I think if we substitute the word *sedative* we will better understand what is meant—sedative or soothing, instead of stimulating and exciting. I find that insomnia quickly yields to its influence, and it is the regular observation of patients to find that "sleeping drugs" are no longer necessary after arrival, while the purity of the air is also so marked that it is as common an observation by persons suffering from chronic headaches to find a remarkable freedom from them. If such are some of the results of "relaxing," I consider them highly desirable and of the greatest value in the treatment of diseases.

We have spoken of the hard character of the drinking water and its value in the treatment of diarrhoea, but in the use of the mineral water of the Spa we have also a powerful agent for the same purpose. Small quantities taken at a reduced tem-

perature are a powerful constipating agent. It has also been demonstrated to be capable of rapidly benefiting cases saturated with the poison of malaria, evidenced by either its anæmia or even febrile condition. For this purpose the excellent installation of the Berthollet, or natural vapour bath, is used. The waters contain both arsenic and iron in minute but apparently sufficient quantities, and also gases such as carbonic, nitrogen, oxygen, and the recently discovered argon and helium. It has yet to be worked out which of the ingredients does the good and how it acts, but the gratifying remains that Bath waters cure the malarial cachexia in a manner that has acquired for them a special reputation. At Bath the douche massage is also available under exceptionally favourable circumstances. Bath is the only spring in Britain where the water issues from the earth at more than the temperature required for the proper carrying out of the process. The spring is also of the class, the indifferent thermal, which has been found to be the most suitable. At all other springs in Britain, Buxton, Harrogate, &c., &c., the water has to be boiled before it can be used, and it is idle to say that the resulting water is the same. When the temperature is raised gases are driven off, and at different temperatures the saline constituents vary. But most important of all is the value of telluric heat. Water heated by nature is heated all through and retains heat for long periods; water heated by artificial means is a poor substitute.

In another journal* I have pointed out the great value of the douche massage as an agent in bringing about a healthy condition of the body by promoting metabolism, and eliminating blood poisons of all sorts from the system. It therefore will prove a valuable help to us in dealing with many of our tropical patients.

To sum up. A sheltered spot with more than its share of the sunshine granted to England, a possibility of picking a desired altitude at which to reside, a country of great beauty, full advantage of which can be taken in walks and drives if the patient's state of health does not limit him to our various parks; and added to all this, a Spa, whose waters are equal to the best, and in many ways specially adapted for our purposes, render Bath a particularly desirable place for tropical patients.

VARIATIONS IN THE FIGURED ELEMENTS OF THE BLOOD IN MALARIA.—A. Dionisi, in the *Il Policlino*, May, 1901, states that in æstivo-autumnal fever, during the febrile stage and for some hours afterwards, the red corpuscles vary in number in the amount of hæmoglobin they contain. In simple tertian and quartan fever the variation is slight. In the cutaneous blood vessels and in the veins the alteration is due partly to the concentration of the blood in them and to their varying calibre, but partly also to the disturbances which characterise the capillary circulation in internal organs.

* *The Scottish Medical and Surgical Journal*, January, 1901.

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THE

Journal of Tropical Medicine

JULY 15, 1901.

The issue of the Journal due on August 1 will be delayed until August 5, so that at least part of the work of the Section of Tropical Diseases may be recorded in that issue. The first day the Section meets is on July 31, and on the two succeeding days, August 1 and 2, the meetings continue. We hope to be able to give a résumé of the papers and discussions during the first two days of the meeting in the early August number.

THE OFFICIAL RESTRAINT PLACED UPON MEDICAL COMMUNICATIONS FROM OFFICERS IN THE PUBLIC SERVICES.

THE papers which appear from time to time in the *Indian Medical Gazette* are creditable alike to the medical officers who communicate these papers, and to the military authorities of the Indian Service who encourage their officers

to contribute their valuable and unique experiences. We wish such freedom belonged to all branches of our naval and military services. There has been in the past, and there evidently still exists at present, a belief that (except perhaps in the Indian Medical Service) it behoves a junior officer to forward his observations through his senior, or even through the office of the Director-General of his department. The excellence of the Indian Medical Service is no doubt fostered and maintained by the liberty afforded them to contribute papers direct to the editors of medical journals.

The fact that papers have to be submitted to a senior officer before being published is apt to stifle individuality, and to check professional zeal. These steps are supposed to be necessary for the sake of discipline, but there is a form of discipline which is not calculated to improve but to lower. A well-regulated discipline is an elevating power, be it applied to habits of mind or body ; but when ill regulated it does harm to the governed as well as to the governor ; it fetters the inclinations of those subjected to it, it hangs over their freedom of action and thought, impeding them at every turn, until, in fact, the character and mind are enslaved by the ever present incubus.

The country complains that the medical men in the public services are of an inferior stamp ; with this we do not agree. The young medical men who enter the navy and army are not the "sweepings of the schools." In days not so long gone by, some of the best men from our medical schools entered these services, and at the present day the fault is not with the quality of the men, as is generally stated, the fault lies within the services themselves. Under the name and shelter of that frequently misapplied term discipline many injustices are perpetrated and many young spirits broken. There is a discipline in life apart from buttoned-up coats and shoulder straps, and one which effects its purpose as thoroughly and certainly ; it is effected without threats of arrest or of punishment, and gains its ends by guiding and directing thoughts and actions into the right channel. This is done by the usual amenities of life and engrained by daily

experience, but the discipline is wholesome and elevating when used aright; not so a discipline of an adventitious character. Than the army or navy, no school of discipline may be better, but it is at times misapplied, misunderstood and misdirected, causing irreparable mischief when the hour of trial comes or when the best interests of the service are at stake.

Greater professional freedom therefore, should be allowed in the public services; freedom to work, to write, and to speak on professional subjects. The necessity to send papers for publication through a senior officer or the Director-General's office, should be removed. Such a step will not be subservient to discipline, but will engender a more thorough discipline than is to be attained in the narrow field of official supervision. The world will be the judge of the communication, and prove, perhaps, a more stern or just judge than the officer to whom may only belong the qualification of "senior."

Discipline should not imply slavery, but a training whereby freedom may safely be given. In this sense therefore, it would be well to remove an autocratic regime which goes far to enslave the medical practitioner in the public services; and that complete professional freedom should be allowed so long as the public interests are not in any way interfered with. In regard to medical information there should be no official secrets; nor should it lie with any other than the medical profession to decide what should be published or what withheld from medical literature. The Admiralty and the War Office are to blame in the matter, not the medical departments of either. The heads of both these departments have for many years done their best to let the experiences gained in the naval and military medical services be known to science; but they are hampered in many ways: by expenses, by the bug-bear of wrongly named discipline, &c. It behoves the whole medical profession to stir itself in this matter, and to insist that there shall be no restraint from writing and speaking on professional matters placed upon our medical brethren in the public services in the name of "discipline."

NON-VENEREAL BUBOES.

PESTIS MINOR?

THE evidence in connection with this ailment is gradually accumulating. From the coast of China cases have been reported by Surgeon Godding, R.N., Cantlie and Begg; by several medical men in the Straits Settlements; in Calcutta by Professor W. R. Simpson; from the Volga in 1878-79 by Payne, &c. Now we hear of the disease from the United States of America in an article entitled "Inguinal Bubo as a Complication of Malarial Fever," by A. C. Smith, M.D., Assistant Surgeon in the Marine Hospital Service, U.S.A., in the *New York Medical Journal*, June 22, 1901.

Dr. Smith states: "My attention has been attracted a number of times within the past dozen years to a group of symptoms which I have never seen described in any text-book on medicine or in current medical literature, and which may be of special interest and importance to report at the present time. The group consists of inguinal bubo associated with malarial fever, the bubo being most commonly non-suppurating and the fever of the æstivo-autumnal type, though not invariably so. The bubo, in the cases which I am about to report, occurred without suspicion of venereal infection and was clearly secondary to the fever and dependent upon it.

"The cases are presented solely as a clinical study. I regret that no blood examinations can be given with them. All were observed before the day of universal blood examinations in malarial fevers had arrived. The course of the fever and the mode of recovery in each are sufficiently distinctive, however, to place the diagnosis beyond probable dispute."

Six cases are fully reported upon and the temperature charts are also communicated.

CASE 1, a coloured man, had suffered from necrosis of toes from frost bite. Some time afterwards, with a severe rigor, a bubo developed in one groin. Quinine was administered, and after profuse sweating the fever disappeared within twenty-four hours, and the bubo subsided.

CASE 2, a Dane. A suppurating bubo in right groin with no local cause. Bubo opened.

CASE 3, a Nova Scotian. Glands in both groins indurated; feverish. Quinine given thrice daily in 10-grain doses, increased after four days to 40 grains daily. Fever and bubo subsided together.

CASE 4, Norwegian. Bubo right groin; feverish. Under quinine fever subsided, and subsequently bubo disappeared without suppuration.

CASE 5, Norwegian. Bubo in left groin ascribed to a blow. Patient believed to have malarial fever. Quinine did not affect fever, but with rest, poulticing, and tonics the bubo disappeared without suppurating.

CASE 6, Dane. Non-venereal bubo in one groin: had been treated some months previously for malaria. Quinine reduced temperature; bubo softened superficially and was opened, but no pus escaped. The patient recovered without suppuration in wound.

Dr. Smith observes: "Besides the foregoing, I observed others at Galveston, of which I have no notes, and one or two at Memphis, Tenn. I have lately seen a case at New York, in the person of a sailor running between this port and Havana, but, unfortunately, only one examination of his blood was made before quinine was administered, and as that examination was not entirely satisfactory I omit reporting the case in detail. Free pigment granules were seen, but the plasmodium itself was not captured in that single search. I hope the attention of other observers will be attracted and that cases will be reported in which a thorough examination of the blood has been made. Such reports are most likely to come from tropical or subtropical regions.

"In *Public Health Reports* for May 3, 1901, a report by Assistant Surgeon Stansfield, U.S. Marine Hospital Service, from Cebu, Philippine Islands, mentions the existence in that island of a large number of cases of mild fever, rarely fatal, accompanied by glandular enlargement. It will be interesting to know what these cases prove to be on investigation."

This peculiar affection is gradually coming to the notice of the profession, and will at no distant date be an important question.

Dr. Smith's cases, in five instances out of six, subsided without suppuration; of Cantlie's cases in Hong Kong, only one bubo out of forty-three cases noted recovered without suppuration; of Begg's seventeen cases in Hankow, all required to be operated on.

The question of malarial complication raised by Dr. Smith is perhaps problematical; and the temperature charts are not characteristic of malarial fever.

The nomenclature of the ailment is unsettled. Non-venereal bubo, climatic bubo, bubo d'emblee, &c., have been employed to designate the disease; but the names convey little information concerning the complaint. Pestis minor is perhaps the best term, as it conveys an idea of the course of the illness; but the word "pestis" leads to scare, and many believe "pestis minor" to be a mild form of true plague, a belief which is wholly unjustifiable.

In London, during 1900-1901, a number of cases of non-venereal buboes have been noted, and as these were exceptional cases in practice, the doctors, under whose notice such cases occurred, not infrequently reported them as suspicious cases of plague. At first styled "pestis minor," they are now returned as "non-venereal buboes," owing to the alarm the name "pestis" created. Although in no sense part and parcel of true plague, the disease should be known scientifically as pestis minor, as it is observed only before, during, or subsequent to, an outbreak of plague, and is perhaps as sure a sign of the presence or adjacency of true plague as are dead or infected rats.

Correspondence.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

GENTLEMEN,—In Dr. Albert Cook's interesting list of diseases met with during his work in Uganda, recently published in the *Journal*, he says that the "jigger" flea first appeared on the Coast in 1899. As he says, however, elsewhere in his article that he himself met with this pest at Machakos in 1897, it would appear that it took somewhere about two years for the "jigger" to travel less than 300 miles, and that, too, along the great caravan road to Uganda. This would appear to be rather a long time, considering the number of caravans walking up and down this road.

As a matter of fact, if my memory serves me right, I remember hearing in March or April, 1898, of the appearance of the "jigger" among the inhabitants of Mombasa for the first time, just at the time when I was leaving the Coast for up country. The first cases occurred, I believe, among some of the Indian police employed in connection with the Customs Department, and I was not able to ascertain how they acquired the pest. Probably one man got infected from one of the native porters walking about the Customs Yard, who had brought it down from up country. All the first cases occurred in one banach and the jiggers were obviously caught from each other.

Yours faithfully,

ARTHUR T. WHITE.

P.M.O., The Nile Reservoir Works.
Late M.O. Uganda Protect. Staff.

The Nile Reservoir Works Hospital.

June 27, 1901.

Current Literature.

LEPROSY.

In a report recently made to the Paris Academy of Medicine, Dr. Besnier stated that leprosy was increasing in France. At the Hospital St. Louis in Paris fourteen cases are being treated. In Savoy and Brittany there are several endemic centres. Dr. Besnier recommended that stringent measures be at once taken to suppress the disease.

MALARIA.

DYSARTHRIA AND MYASTHENIA DUE TO MALARIA.—In the *Il Policlinico* for May, 1901, L. Panichi describes two cases of dysarthria. In the case of one man, the letters r, s, z, and y were pronounced with difficulty, and he spoke slowly, pausing between words and even between syllables of words. In the second case the patient found n, r, and s especially difficult to enunciate.

Myasthenia was observed in one case. The limbs, muscles, active movements were very slow, the fingers were very tremulous in a certain position, and the left foot was occasionally seized with a rhythmical shaking. The patient could not maintain the erect position.

Malarial parasites were found in the blood of the three patients, and quinine cured in every instance.

INTERMITTENT NERVOUS AILMENTS ASCRIBED TO MALARIA.—In the *Revue de Médecine*, May 10, 1901,

M. Busquet reports a case of intermittent paralysis of both anal and vesical sphincters and of the right leg appearing during febrile attacks due to malaria. The paralysis disappeared during the afebrile periods. Malarial parasites were found in the blood and the symptoms disappeared under the influence of quinine.

YELLOW FEVER.

THE SPREAD OF YELLOW FEVER IN HOUSES.—In an article in the *Medical Record* for June 15, 1901, Dr. H. R. Carter alludes to the infective power of the house, and sums up his beliefs as follows:—

(1) Cases of yellow fever which occur aboard ship after disinfection at maritime quarantine stations have not been followed by any others among the crew.

Eleven vessels disinfected from "at once" to five days after the first case.

(2) Cases of yellow fever which occur in houses disinfected soon after occurrence were not followed by other cases among the inmates.

Five houses—twenty-four susceptible inmates—disinfected, one seven days, one two days, and the rest probably four to ten days after first case.

In no case has the contrary been observed.

(3) Cases of yellow fever which occurred in houses vacated soon after have not been followed by other cases among the inmates leaving, although cases occurred among those who remained in the houses or in the neighbourhood.

From seven houses forty-six inmates were removed from two to eight days after development of the first case. In no case has the contrary been observed.

With these consider the forty-nine people moved from houses in which yellow fever had occurred to the Jacksonville "Observation Camp," none of whom developed yellow fever.

(4) Cases of yellow fever which occur in clean houses are not followed by other cases among the inmates exposed to no other infection until after such time as shows that the disease was not contracted for a number of days after the development of the first case, although these same inmates do develop yellow fever from these same houses later.

Letters, Communications, &c., have been received from:—

- A.—Dr. Albert S. Ashmead (New York).
- B.—Dr. Charles Begg (Bath).
- C.—Dr. Chastelleux (Mauritius); Dr. Kerr Cross (Blantyre); Mr. P. Carnody, F.I.C., F.C.S. (Trinidad).
- D.—Dr. A. B. Dalgetty (South Sylhet); Dr. C. W. Daniels (London).
- G.—Dr. John Gimlette (Pahang).
- K.—Dr. Wm. Kirk (Shanghai); Dr. W. E. de Korte (Graaff Reinet); Dr. Lim Boon Keng (Singapore).
- N.—Dr. P. Nightingale (Bangkok).
- P.—Mr. F. Pearse (Calcutta).
- R.—Dr. Ronald Ross (Liverpool).
- S.—Dr. Joseph Scott (Shiraz); Dr. Sambon (London).
- T.—D. W. Thomson (Turriff).

EXCHANGES.

Annali di Medicina Navale.
 Archiv für Schiffs u. Tropen Hygiene.
 Archives de Medicine Navale.
 Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
 Australasian Medical Gazette.
 Boletín de Medicina Naval.
 Boston Medical and Surgical Journal.
 Bristol Medico-Chirurgical Journal.
 British and Colonial Druggist.
 British Journal of Dermatology.
 British Medical Journal.
 Brooklyn Medical Journal.
 Climate.
 Clinical Journal.
 Clinical Review.
 Giornale Medico del R. Esercito.
 Hongkong Telegraph.
 Il Policlinico.
 Indian Engineering.
 Indian Medical Gazette.
 Indian Medical Record.
 Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.
 Journal of the American Medical Association.
 La Grèce Médicale.
 Lancet.
 Liverpool Medico-Chirurgical Journal.
 Medical Brief.
 Medical Missionary Journal.
 Medical Record.
 Merck's Archives.
 New York Medical Journal.
 New York Post-Graduate.
 Pacific Medical Journal.
 Polyclinic.
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 Revista de Medicina Tropical.
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 The Medical and Surgical Review of Reviews.
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5.—Authors desiring reprints of their communications to the *JOURNAL OF TROPICAL MEDICINE* should communicate with the Editors.

6.—Correspondents should look for replies under the heading "Answers to Correspondents."

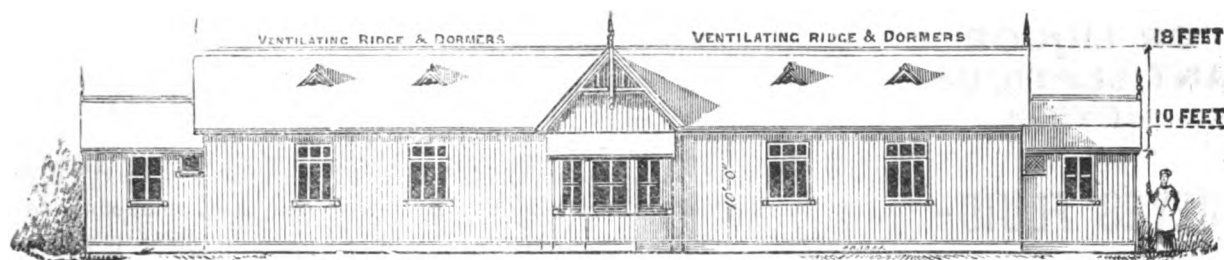
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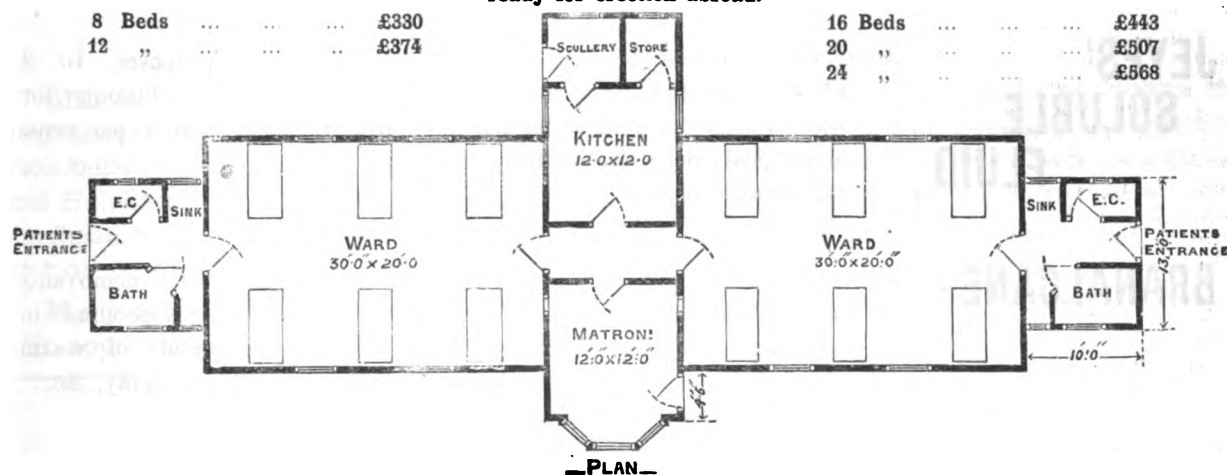


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*BIHYDROBROMATE	60.0 %	" 7 "	1.23
BISULPHATE	59.1 %	" 11 "	1.24
PHOSPHATE	72.8 %	" 78 "	1.01
VALERIANATE	75.7 %	" 110 "	.97
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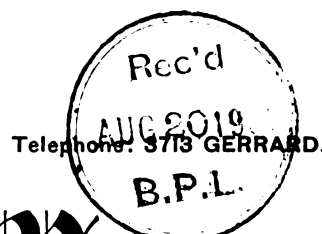
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THE Journal of Tropical Medicine

A FORTNIGHTLY JOURNAL DEVOTED TO MEDICAL, SURGICAL AND GYNÆCOLOGICAL WORK IN THE TROPICS.

EDITED BY JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D., F.R.C.P.

No. 15. Vol. IV.]

LONDON, THURSDAY, AUGUST 1, 1901.

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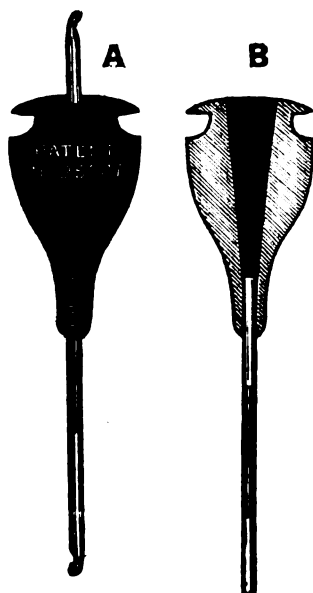
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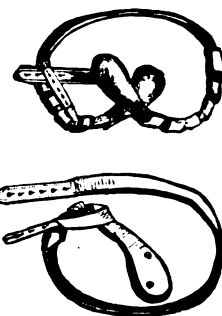
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The Journal of Tropical Medicine.

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LECTURE ON PLAGUE.

By PROFESSOR W. J. SIMPSON.
Cape Town, South Africa.

PROFESSOR SIMPSON, at the request of the Cape Town Branch of the British Medical Association, delivered a Lecture on Plague, June 15, 1901, an abstract from which is here appended. After discussing the history of plague, Professor Simpson stated that the causes of lesser mortality of the present pandemic compared with previous pandemics were a lessened virulence of the virus, and the fact that the bubonic type prevailed for the most part in the pandemic through which we were passing in contradistinction to the pneumonic type, which characterised former outbreaks, attended by a higher mortality. Professor Simpson then proceeded to deal with the—

HISTORY OF PLAGUE IN SOUTH AFRICA.

The source of importation of the disease into Cape Town is not very clear, and requires further inquiry. Dr. Gregory, in his able investigation into the case of plague at Middelburg, in the Transvaal, in an Indian in February of 1899, and the history of which he brought before your Society, and which was published in the *South African Medical Journal*, of August of that year, has shown that there were cases of plague among Indians at Delagoa Bay in December of 1898, and January and February of 1899. There then followed the outbreak at Magude, which, I understand from Dr. Turner, who investigated the outbreak, was limited to some 300 persons. Dr. Kollé attributed its limitation to the absence of rats. On what evidence he bases this conclusion I am unable to say, and I confess I am perplexed, because I see that Dr. Gregory notes that the rats were dying in Delagoa Bay.

No more is heard of plague until March 5, 1900, when the s.s. *Kilburn* arrived in Table Bay from Rosario, Argentina, with a cargo of forage for the

military authorities. From Dr. Gregory's report I learn that there were three undoubted cases of plague on board, and probably a fourth, that of the Captain, who died the day before arrival of the ship. The ship was ordered to Saldanha Bay, the crew were landed at the quarantine station, and the greatest precautions were taken. The Customs-house officer in charge of the Quarantine Station was attacked while on duty with pneumonia, and it is, I understand, a moot point whether his disease was plague or not.

The next suspicious cases of plague are heard of near King William's Town in November, 1900. I learn that there is no written report on these cases, but from the newspaper reports of that date I gather that at least four of the cases had bubonic swellings. If this is so, there can be little doubt that some at least of the cases were plague.

The first undoubted case of plague in the Cape Peninsula was brought to the notice of Dr. Gregory by Dr. Matthew Hewat, of Mowbray, in the person of Mr. MacCullum, a clerk, whose place of work was No. 4 Storage Shed at the South Arm of the Harbour. He was attacked on January 27, 1901, sent to Rondebosch Hospital on February 2, and was removed to Uitvlugt, the newly prepared plague hospital, on February 9. Dr. Gregory thinks that two deaths which occurred a week before this may fairly be attributed to plague. The first recognised case was quickly followed by two coloured boys from the same shed. The three of them had for more than a week past assisted in trapping rats and then letting them loose for the dog to chase them. There was also an overpowering smell under the office. This was found to be due to a number of dead rats which the two boys removed with their hands from under the floors and threw into the sea.

RATS DYING OF PLAGUE IN THE CAPE TOWN DOCKS IN SEPTEMBER, 1900.

On inquiry into the sickness among rats, I find it dates back at least to the end of September or

beginning of October. Occasionally rats at that time were noticed by the clerks in the sheds, especially in No. 1 and No. 3, to be ill-looking, to have lost their powers of quick movement, to be more or less covered with sores, to be swollen under their legs, and in moving about to topple over. The boys in the shed sometimes picked them up and threw them into the sea. Sick and dead rats appear to have been noticed more frequently in No. 1 shed. But by December the numbers seen to be ill became more numerous, and by January such was the stench under some of the stacks of preserved meat between the dunnage outside the sheds that it was unpleasant to work at them. It was about the end of January that it was observed the rats began to disappear from all the store sheds and surroundings of the South Arm, and it has only been within the last few days that there is evidence of their returning.

How the rats became infected I am unable to say at this present stage. It is to be noted, however, that the disease amongst them began at the South Arm, devoted entirely to the landing and storage of military supplies, and that from the early part of 1900 and throughout the year, forage was brought in ships to the South Arm from the infected ports of Rosario in Argentina, from Bombay, and from Sydney. Actual cases of plague occurred on one of these ships in March, 1900.

CERTAIN TYPES OF PLAGUE APT TO PASS UNRECOGNISED AT THE COMMENCEMENT OF AN EPIDEMIC.

The sickness and mortality among the rats prevailed for at least four months before the first recognised case of plague. This is a long time to elapse without any manifestation of the disease in man, and though it is a possibility which may be explained in some other way, I am inclined to think that unrecognised cases of plague, probably of a mild or of a suddenly fatal type, occurred among the natives working at the docks long before the outbreak in February, and that when, apart from the lung-sickness at Izeli, which does not appear to have been plague, we hear of the possibility of plague cases among natives near King William's Town, the source of which was suspected to be the Modder River, it is not at all unlikely that the real source was the Docks in Cape Town.

The occurrence of mild cases has always been the difficult factor in tracing out first cases of plague. That mild cases of actual glandular swellings have occurred in this country I learnt accidentally from two medical officers who were confronted with such cases last February in troops that were trekking in the north of this colony. For more than a month previous to my inquiry the troops had been quite free, so that I had no opportunity of seeing the cases. The nature of the disease when it occurs in the ambulant form is very apt to be overlooked, because of the mildness of the symptoms. There is usually slight fever, though at times there is none, there is malaise, headache, congested eyes, and a glandular swelling, and if the sickness is in an acute form the duration of the illness is only a few days, while if it is chronic it lasts for six weeks and a couple of months, producing great weakness and prostration.

The fulminating type and the pneumonic type being fatal forms of plague, often without buboes, are also readily mistaken for other diseases, such as gastro-enteritis, influenza, and pneumonia of a severe type, when there is no suspicion of plague existing in the locality. Though I think it not at all improbable that cases of the types mentioned occurred before Mr. MacCullum was attacked on January 27, 1901, there could, after all, have been not many cases, especially of a fatal kind, or else they would have attracted attention. The season and condition of the weather may not have been favourable in October, November, December, and January for an extensive manifestation or spread of the disease in the Docks where the rats were dying. It is to be observed that they began to leave the Docks more or less *en masse* at the end of January, and to migrate into District No. 1, and it is in this district that the first indigenous cases not traceable to the Docks first occurred.

EFFECT OF INOCULATION AND OF EVACUATION OF INFECTED AREAS AS PREVENTIVE MEASURES.

I shall not enter into the general and special measures which have been taken in this epidemic. There are two, however, which ought to be referred to. One is the removal of the natives to a location, the other is inoculation. When plague was found to be spreading rapidly among the natives, it was decided to evacuate the plague-infected areas and remove the natives to a location on the outskirts of the town. The accommodation was provided most expeditiously and under great pressure by the Public Works Department. On the completion of a certain number of huts, an order was issued by Mr. Graham, the Colonial Secretary, for the removal of the natives. In the course of one afternoon a thousand were removed, and in a short time all the natives in Cape Town, except some that were accommodated by the Harbour Board inside the Docks, were removed from the town and placed under sanitary supervision in comfortable huts made of corrugated iron. All except about twelve were inoculated, and with the exception of the first few days of their residence in the location, when cases of plague developed among those who already had the disease in their system, there have only been four cases since March 12 in a community of 7,000 persons, and this notwithstanding the fact that they go into the town to work at the Docks and in some of the most infected centres of the town. In addition to this there is the fact mentioned by Dr. Elliott, of the Harbour Board, that of 1,500 dock labourers inoculated, only one was afterwards attacked with plague. There can be little doubt that if it had been possible for a similar measure on a more extended scale to have been undertaken with regard to some of the most overcrowded, most unsanitary, and most infected quarters inhabited by the Malays, the poorer class of Europeans and coloured population, and then the rats in the locality destroyed, the disease could have been as effectually stamped out.

With regard to inoculation, some misconception has arisen as to its dangers, and as to its inefficiency. Both of these were thoroughly tested in India before the inoculation was introduced as a general preventive, and no general statements will upset what

has been founded on very careful observation and experiment; viz., that the inoculations are perfectly harmless if properly performed, with properly tested vaccine, and if these precautions are taken the immunity secured by the inoculation is an exceedingly high one. Nothing that has occurred in this epidemic has shaken this position. Unfortunately the inoculations do not give immediate protection. It requires six or seven days to secure immunity, but this is the case also with vaccination against smallpox; the immunity not being secured until the eighth day, and we sometimes find a person attacked with smallpox who has been vaccinated a few days before, and the vaccine vesicle and the smallpox eruption on the same patient. I have not been able to obtain information regarding the exact position of matters, for there appears to have been no proper records kept, but so far as they go the inoculations show a highly protective effect.

It appears that fourteen persons out of 16,000 who were inoculated have been attacked with plague, and 637 persons out of 134,000 who have not been inoculated. These calculated give the following results:—

Numbers inoculated	16,000
Of these the numbers attacked have been	14

Equal .875 per 1,000 of inoculated have been attacked.

The whole population	150,000
Deduct inoculated	16,000

Uninoculated	134,000
Total attacks	651
Deduct attacks amongst inoculated	14

Attacks amongst not inoculated	637
--------------------------------	-----

Equal 4.75 per 1,000 of not inoculated have been attacked.

If the inoculated had been attacked at the same rate as the not inoculated, the numbers would have been 76 instead of 14, which accordingly shows a ratio of reduction about 82 per cent. The incidence on the 16,000 inoculated has been more than five times less than the incidence on the 134,000 not inoculated. In a country such as South Africa, with its native and mixed population, a good portion of which in the towns is living under the gravest insanitary conditions, and which by no manner of means can in a few months be taught to be clean or be brought under a proper sanitary system, I believe that inoculation of the unsanitary classes and of those living in infected areas will be the only practical and effectual safeguard against plague.

REMARKS ON YAWS AND ON THE DISEASES MOST FREQUENTLY MET WITH IN ST. LUCIA.

By ST. GEO. GRAY, M.B., B.Ch.,

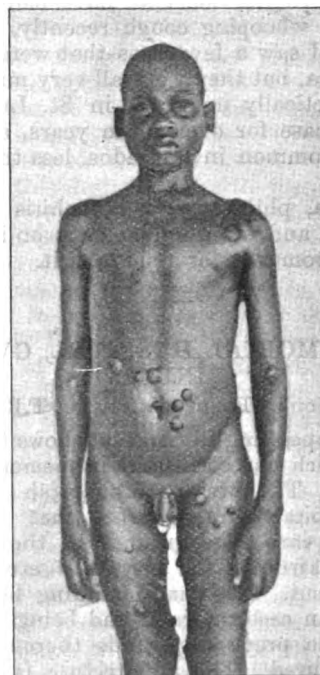
Colonial Assistant-Surgeon, Castries, St. Lucia, West Indies.

As you have expressed a wish for any notes or photographs of tropical diseases, the enclosed photos of some of my patients at the Yaws Hospital will probably be of interest to you, imperfect as they are.

They are among my first attempts, but I hope to improve, and that the next lot I send you will be nearer perfection.

I think those I send give a better idea of the appearance of the disease than the plate in the September number of the JOURNAL.

The chief points to be noted are the (1) *sessile granulomata*, which, under favourable conditions, dry up, leaving maculæ or dark—often black—stains, which ultimately disappear, leaving no trace. I have seen a large granuloma three inches in diameter disappear completely in a comparatively short time leaving no trace whatever. (2) The *femoral buboes*, which are nearly always, if not invariably, present in every case of yaws that has ceased to be *local*. A little girl under



my charge is covered from head to foot with a papulo-squamous eruption, which I expect to become granulomata in a few weeks. Under certain conditions yaws seems to run a definite course, but I have not yet worked it out fully. It appears to be at first local, there being a few granulomata and squamæ on some part of the body (face, genitals, or feet). These get nearly well, when suddenly a papulo-squamous eruption comes out all over the body, and after a certain time (not yet determined) many of the papules, or "guinea-corn yaws," as they are called, become granulomata. These dry up after a time and the patient is quite well, having no trace of yaws. If, however, as is generally the case, the patient returns, before complete cure, to the old mode of living and to the same insanitary surroundings in which the disease was acquired, a second crop is almost certain to come out, sometimes worse than the original one.

Occasionally, if the disease has not yet become

constitutional, removal to a more sanitary neighbourhood, and a sufficient quantity of good food, fresh air, and sea bathing will be all that is necessary to effect a complete cure.

I have observed that those granulomata that are exposed to the air dry up much more rapidly than those that are kept moist by perspiration under the clothing, and that those in the axillæ and surrounding the anus are always the last to dry up. These nearly always require some desiccating application such as powdered alum, and are often very intractable.

I have full notes of nearly seventy cases of yaws and hope to publish an analysis of them some day.

DISEASES MET WITH IN ST. LUCIA.

I have been interested in the discussion in the JOURNAL as to the prevalence of certain diseases in the tropics. In St. Lucia we have had epidemics of measles and whooping cough recently, and a couple of years ago I saw a few cases that were suspiciously like scarlatina, but they were all very mild. Typhoid fever is practically unknown in St. Lucia. I have not seen a case for over seven years, although it is said to be common in Barbados, less than 100 miles away.

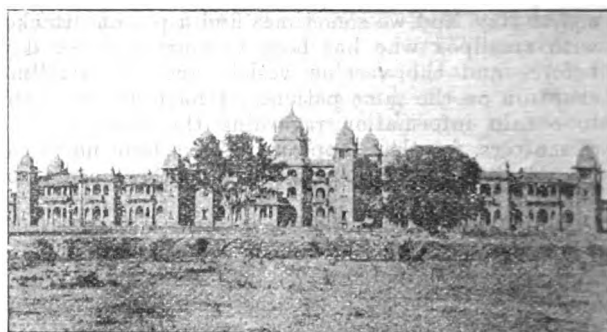
Pneumonia, phthisis and bronchitis are common enough here, and when influenza is on its rounds St. Lucia often comes in for a share of it.

THE MEMORIAL HOSPITAL, GWALIOR, INDIA.

Description by FREDERICK PEARSE, F.R.C.S.Eng.

THE accompanying illustration shows the Memorial Hospital which has been built in memory of the late Maharajah. The present Maharajah is the donor of the hospital ship *Gwalior* that was sent to China last year. The grounds of the hospital are on the outskirts of the city, and are about sixty acres in extent. The main building lies north and south with an eastern front, and being thus at right angles to the prevailing winds thorough perfilation of air is secured. The architecture is of the Indo-Saracenic style. The building, about 612 feet in length, consists of five blocks connected with covered passages. The whole is built on a plinth four feet high, so as to ensure dryness of the hospital floor under all conditions of climate. The centre block, consisting of three stories, contains administrative offices, waiting rooms, and quarters for nurses and house surgeons, in addition to two wards. The two end blocks consist of ground floor only, and comprise dispensary, waiting room, and medical stores. The main side blocks have two stories, and measure from ground floor to first floor twenty feet, and from first floor to roof twenty-one feet; they contain ten wards as follows: Six wards, 57 feet, by 22 feet 6 inches, by 19 feet 9 inches, each taking fourteen beds. The area of each ward being 1,292 square feet, this gives 92 superficial feet per bed. The cubic capacity is 1,822 cubic feet per bed. The other four wards are smaller in size but give more superficial feet per bed. The centre block contains two wards to take ten beds each, giving 184 square feet per bed, and 2,583 cubic feet per bed. The

ground floor wards are laid in mosaic work in marble, but the first and second floors are boarded. All the wards are surrounded with a verandah 12 feet wide. The whole building is fitted with electric light, and there is a hydraulic lift in the central block. Hot and cold water is laid on all over the hospital, and the water tanks admit a supply equal to thirty-six gallons per head per day. The drinking water is filtered by the Mallie-Pasteur filters.



MEMORIAL HOSPITAL, GWALIOR.

The hospital is of course entirely for natives, and in designing it great care was taken to ensure the privacy of female patients, as on this altogether depends the popularity of the hospital amongst the female population. A female patient will be able to come to the hospital, be examined, obtain medicine, and leave the hospital without seeing or being seen by a male patient.

In addition to the main building described, there are six separate blocks built on the plan of cottage hospitals, for the reception of Purdah Nashin women and people of the better class who wish to be attended on by their own people. The photograph I have taken from an illustration in *Indian Engineering*, and I am indebted to the editor for many of the above particulars.

THE ETIOLOGY AND TREATMENT OF PRICKLY HEAT.

THE interesting papers that have appeared in your valuable JOURNAL, from time to time, on the above subject, and the importance of the subject to so many residents in the tropics whose lives are frequently made miserable by it, must be my excuse for placing on record the results of my thirty-two years' experience and observations, both lay and professional, subjective and objective. Seven years were passed at sea, in different parts of the world, but mostly in the tropics, and the last twenty-five years as Government Medical Officer in the West Indies; the experience of which I submit for the further elucidation of the subject.

In my opinion all the papers I have read in your JOURNAL, valuable as they are in their lines of treatment, travel round the subject. I believe prickly heat to be, as its old name "eczema solare" expresses, a true eczema running from moist vesicles

to dry branny scales, and that the popular idea that it is salutary is a true one, i.e., its presence is protective when established. It is nature expressing "You have been trying to introduce into the system poisons that I have thrown out once, I won't have them, so I throw them out again."

Both sudoriparous and seborrhaceous secretions are eliminative in purpose, and excrete deleterious products. These, if thrown away, as they are intended to be, and are by those who do not wear clothes, give no further trouble; but held by any garment and kept in application to the skin, are more or less inuncted, and prickly heat is the mode of their rejection. For years I have been free from this trouble, to which for a long time I was subject; and I attribute it to having (in addition to adopting those means recommended, which tend to make a skin healthy), avoided soap and everything that by chemical means hastens the separation of the epidermis, and interferes with its natural secretory power. Veterinary surgeons will tell you, "Do not wash animals with soap if you wish to keep their skins healthy."

I have used cocoanut oil sparingly, as it should be used, for years; but lately have adopted the almond oil and lanoline, 1 to 7, with ol. rosæ, and find it a most delicious and elegant preparation. It is difficult to get cocoanut oil free from taint of burn, even though not rancid, and to take scented oil and maintain its aroma. Then the dusting powder recommended is most valuable as a further aid. When no other has been handy I have used fine Indian corn meal with advantage; but my chief reliance is on thin cotton garments under my Jaegers, and changing my clothes, which I try to do every time I come in, as frequently as three or four times a day. These cotton garments can be washed in a hand-basin with ammonia and water, and dried quickly; while the Jaegers can be worn a week, free from all trace of perspiration or odour of any kind. Under this régime prickly heat quickly disappears.

I have seldom or never seen prickly heat on the lower extremities, below the line of closely applied garments. Intertrigo in all its forms is, I think, of a like nature.

By a Government Medical Officer.
West Indies.

QUININE AND BLACKWATER FEVER.—Dr. M. Eder, of Palmira, Colombia, S. America, informs us that the Colombians (Spanish natives) in that locality, take an inordinate quantity of quinine, 20 grs. per diem or more being sometimes administered to young children and proportionately more to adults. Nevertheless *blackwater fever* is quite unknown there, and this fact is in striking opposition to R. Koch's opinion that blackwater fever is *per se* quinine poisoning.

STRYCHNIA IN SNAKE-BITE.—The following account of the highly successful treatment of a case of snake-bite by Dr. Babu Atul Chunder Banerjee, Chief Surgeon of the Balijan Tea Garden Hospital, is taken from the *Times of Assam*, in the author's own words:—"A coolie woman, while working in the garden, was bitten by a poisonous snake which

came out suddenly from the neighbouring jungle. Soon after she became insensible, and was brought to the garden hospital, a distance of a mile and a half, being carried by other coolies on a *charpai*. I found her quite unconscious, and immediately injected 15 minims of liquor strychnia hydrochlor. over the heart. She soon recovered consciousness, and I made incisions at the bite on the leg, and burnt it with strong nitric acid. Finding that the patient was going to collapse, I again repeated the strychnia injection in the muscles of her left arm and followed it with a similar dose by the mouth. The patient began henceforth to steadily progress towards recovery. I did not stop there, but continued administering minim doses of the drug at intervals. In addition I gave her stimulants, and kept her moving to and fro. The woman was all right in the course of four or five hours."

THE ENDEMIC OCCURRENCE OF HÆMOGLOBINURIA OF CATTLE (SO-CALLED TEXAS FEVER) IN GERMANY. Preliminary Report by Dr. Hans Ziemann, Staff-Surgeon on board s.s. *Moltke*. (*Deutsche Med. Wochenschr.*, 1901, No. 21.)

Until 1897, this destructive cattle disease was only known in Texas, Roumania, Finland, the Roman Campagna, and Sardinia; in that year, however, the author discovered a new centre in Northern Italy, namely, at Comachio,* south of Venice, and he has now been able to confirm its endemic occurrence in Germany also. The disease was discovered in the Grand Duchy of Oldenburg, in the district of the so-called New Forest of Neuenburg, where, as throughout the entire district of Oldenburg, it has been endemic for at least 100 years, probably longer, and is locally designated "bloody urine of cattle."

The blood-parasite, called *Pirosoma bigeminum*, was found by Theobald Smith in America, and is regarded as the cause of Texas fever. The discovery was made in October, 1900, and shortly afterwards the Director of the Zoological Institute in Rovigno, Privatdozent Dr. Schaudinn, obtained information upon the subject. In consequence of his official engagements it was impossible for this gentleman to carry out the local experimental investigations he had planned for this summer. I therefore think it desirable to furnish a brief preliminary statement of the results I obtained, namely: That it may be accepted as absolutely confirmed that the disease, well-known in Germany to veterinary surgeons as "bloody urine of cattle," which year by year does so much damage, and which in the text-books of veterinary pathology is attributed to the eating of poisonous plants, is very nearly related to the parasitical disease, *Texas fever*. Reports as to the experimental transmissions of the disease, its further geographical distribution in Germany, as, for instance, in the Black Forest, Upper Bavaria, Westphalia, East Holstein, &c., must be withheld for the next report.

The confirmation of the fact that the bloody urine of cattle in Germany is also caused by blood parasites, which, as in Texas, may be transmitted by ticks, is a matter that may be regarded as one of considerable importance.

* Ziemann, *Ueber Malaria und andere Blutparasiten*. Jena, G. Fischer.

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THE

Journal of Tropical Medicine

AUGUST 1, 1901.

THE INVALID ON BOARD SHIP. ADVISABILITY OF CARRYING A TRAINED NURSE ON PASSENGER STEAMERS.

THE lot of an invalid on board ship, whether old or young, male or female, a passenger or a member of the crew, is at all times an uncomfortable one. But more than discomfort may obtain; positive danger to life is apt to occur, even on ships in which a medical officer is carried, from lack of skilled nursing.

Leaving the British ports many "trip" steamers proceed yearly on "pleasure" voyages to different foreign countries; the Mediterranean being one of the most popular routes. In one of these steamers with every cabin and berth occupied a few cases of serious illness test the accommodation to the utmost, and throw the organisation of the steward's department out of gear. A cabin on deck may be given up to the sick, or

the captain's cabin may even be placed at their disposal, and so far as actual housing goes, unless the sick are many, the invalid may be comfortable; but beyond this everything is at "sixes and sevens." The difficulty of obtaining food is considerable; the stewards and waiters have their hands full in the saloons, and it is no part of their business, nor even is it often possible for them, to attend upon the invalid except at long intervals. Moreover, preparing food suitable for an invalid proves an extra labour to the cooks; and when the food does appear, it seldom arrives in a palatable fashion.

Should the patient have a high temperature, or be attacked by pneumonia or dysentery, the presence of a nurse is imperative, unless the patient's life is to be jeopardised. The medical officer cannot attend to his special duties and nurse too, and, however willing he may be, he cannot work both night and day as a nurse.

During long voyages, when the invalid is returning from the tropics, it is often a question of careful nursing whether he or she reaches home. Patients suffering from chronic intestinal ailments are in especial danger from want of nursing skill, and the burial at sea of a patient sent home on account of failing health, but too frequently testifies to the strain life on board ship is to an invalid. For the benefit of ailing passengers there can be no doubt as to the expediency of carrying a nurse on passenger steamers; and so necessitous does the practice appear that we hope every liner carrying passengers may soon be compelled to include a nurse as part of the *personnel* of equipment.

Women are frequently compelled to travel whilst *enceinte*; and the miseries and dangers experienced by women travelling from the tropics to be confined at home, or of newly married women leaving England for the tropics who are threatened by, or actually suffer from, miscarriage or abortion, when no nurse is on board, are difficult to exaggerate.

The steamship companies will, no doubt, raise objection on the score of expense; but the knowledge that a nurse was on board and available for duty would add to the popularity of any line

of vessels. Objections might also be raised that any line of passenger steamers advertising a nurse amongst the *personnel* would be apt to get crowded with invalids, and that healthy persons would not care to travel by the same vessels. This is a very short-sighted policy on the part of passengers, for, however healthy, they never know when they may themselves be thankful for the service of a nurse. One way of getting over the difficulty would be, that persons requiring the services of a nurse should pay for their nursing, at rates corresponding to those charged in private nursing establishments.

The discomforts of travelling by sea, under the most favourable conditions, are considerable; but when illness supervenes, the discomforts frequently amount to real danger to life from want of skilled attention. It behoves, therefore, the travelling public to agitate in the matter, and to exercise moral if not legal compulsion to see that lives are not jeopardised on board ship, by either sentimental or financial hesitations and groundless objections, on the part of steamship companies or their servants.

British Medical Association.

MEETING AT CHELTENHAM.

SECTION OF TROPICAL DISEASES.

ON the first day of the meeting this section was well attended. Amongst those present were Dr. Patrick Manson, C.M.G., F.R.S.; Surgeon-General Harvey, C.B.; Mr. P. J. Freyer; Dr. Max Simon, C.M.G.; Dr. F. F. Johns; Professor F. M. Sandwith (Cairo); Dr. Guthrie Rankin; Dr. Andrew Duncan; Dr. G. P. Jordan (Hong Kong); Colonel King, I.M.S.; Dr. Philpotts; Dr. Moffat (Uganda); Dr. Hill (Pakhoi); Dr. Chisholm (Sydney); Captain Battye, I.M.S.; Captain Milne, I.M.S.

Wednesday, July 31.

MR. JAMES CANTLIE, F.R.C.S., Vice-President, in the Chair.

The Chairman remarked that he had to regret the absence of Major Ronald Ross, F.R.S., President of the Section. Major Ross, as was well known, was at the present moment engaged on a scientific expedition sent out by the Liverpool School of Tropical Medicine to the West Coast of Africa, to demonstrate the most ready method of destroying mosquitoes and their breeding places. One of the

Vice-Presidents, Mr. Johnson Smith, F.R.C.S., was also unavoidably absent.

MR. CANTLIE read an Address by Ronald Ross, F.R.C.S., F.R.S., Major, I.M.S. (Rtd.), Lecturer in Tropical Medicine, University College, Liverpool, in which he expressed his regret that he was unable to present his Address to the Section in person. The address will be printed in full in our next issue.

STONE IN THE TROPICS.

DISCUSSION OPENED BY MR. P. J. FREYER (LONDON).

MR. FREYER confined his remarks on "Stone" to experiences gained in India. The actual causation of urinary calculi in India, Mr. Freyer remarked, would be perhaps best elucidated by considering the geographical distribution of stone in India. He wished it, however, to be understood he was only dealing with the subjects of oxalate of lime and uric acid calculi, not with the phosphatic variety. The ætiology of the last named arose no doubt from disorders affecting the urinary tract; but the formation of the oxalate of lime and uric acid calculi had a different interpretation. Prostatic enlargements were less commonly brought under the notice of the surgeon by the natives of India, not, perhaps, because the condition prevailed to a less extent, but because natives affected by prostatic troubles died without seeking surgical aid.

Distribution.—Urinary calculi were met with amongst persons inhabiting the alluvial plains bordering on the Indus and along the upper reaches of the Ganges. Mr. Freyer believed that the reason for the inhabitants of these regions being attacked was due to the fact that the Indus and Ganges rivers rise amongst mountains of a cretaceous nature, and that the lime-impregnated water was carried down and used as drinking water by those dwelling along their banks. The Punjab, the North-West Provinces, Sindh, and Gujerat were the chief stone-producing districts, Sindh being perhaps the most highly infected region with urinary calculi in the world. The countries around the upper part of the Ganges only are affected, whereas the districts along the lower part of the Ganges, where the river runs through Eastern Bengal, are well nigh free of the disease.

Climatological.—One reason assigned for the prevalence of calculi in these districts was that the area suffered from extremes of heat and cold. During the extreme heat of summer the urine became concentrated to such an extent that crystalline deposits were apt to result, and that the extreme (comparative) cold of winter caused abeyance of the hepatic functions.

Food as it affects the formation of calculi.—Although many eminent authorities assert that calculus disorders of the urinary tract are due to dietetic irregularities and errors, this can hardly apply in India. Eating rice has been stated to be the cause of stone; but, as it so happens, in the localities in which stone most prevails, wheat, barley, and other cereals are largely consumed. Flesh is eaten by the Mahomedans, but the geographical distribution of stone is not co-extensive therewith;

for in Western and Eastern Bengal there is a marked difference in the prevalence of stone amongst Mahomedans, those in the Western area being severely attacked, whilst those in the Eastern or Lower Bengal are scarcely affected at all.

Concerning the surgical aspect of stone in the bladder, litholapaxy is the operation which, to well nigh the exclusion of other methods, commends itself. In 1882, in India, the mortality from lateral lithotomy amounted to 30 per cent. of those operated upon; a figure so high that its recommendation might well seriously be considered. The mortality statistics gathered from the several operations, and published in 1895, were as follows:—Of 147 supra-pubic lithotomies, 42·17 per cent. died; of 7,000 perineal lithotomies, 11·45 per cent. died; of 10,079 litholapaxies, 3·96 per cent. died. The high mortality of the supra-pubic operation and the low death-rate after litholapaxy speak for themselves.

Surgeons at home are wont to declare that recovery after operation in India is to be expected, and more easy of attainment, owing to the simplicity of the life of the native engendering tissues more easy to heal than in the case of the high-fed European. This is a popular fallacy and has no bearing in the recoveries or mortality statistics. Kidney disease is as wide-spread amongst natives in India as amongst Europeans in Europe; and it is neither scientific or quite fair to fall back upon fallacies of that sort to explain away favourable reports of surgical work in India.

Mr. Freyer bore high testimony to the operation skill and courage of Colonel Keegan, I.M.S., who established litholapaxy in children as a rational operation.

Surgeon-General HARVEY, C.B., Director-General Army Medical Service, India, endorsed the statements Mr. Freyer had made concerning the success of litholapaxy in India. The old operation of lithotritry at several sittings had given place to crushing and removal at one sitting. It was a most important point in India when practising amongst the poorer natives, to finish the operation at one sitting, for in former years, when the old operation was in vogue, two of his patients ran away after one or two sittings with the fragments of stone still in their bladder. He had operated on twenty-two cases of stone by lithotritry, of which number three died. To Mr. Freyer and Colonel Keegan, not only India, but surgery throughout the world, was indebted for having established litholapaxy on a sound basis due to the extensive experience each had gained in India.

Dr. MANSON, C.M.G., F.R.S., agreed with the remarks made by Mr. Freyer concerning the practical details of the removal of stone; but he differed from him as to the question of the ætiology of the complaint. Dr. Manson did not believe that the imbibition of water containing lime salts was responsible for the formation of calculi containing uric acid or oxalate of lime; and although, according to Mr. Freyer, it seems that the geographical distribution of stone coincides with the geological presence of calcareous formation in India, the rule certainly does not apply universally. In Great Britain there are calcareous areas where stone is

rare, whilst there are granitic areas—Aberdeenshire for example—where stone is very common. In Canton the rock is granite, and stone is probably quite as prevalent there as it is in Hyderabad, Sind. There are only two forms of calculi, the ætiology of which is positively known to us; one is dependent on foreign bodies introduced into the urinary tract, and the other is caused by the ova of Bilharzia. The formation of the stone in both of these instances depends on the presence of a nucleus. Similarly Dr. Manson believes that in other cases of stone the explanation of their geographical distribution will be found from a study of the nucleus of the calculus. The patchy distribution of the complaint as well as the analogy of Bilharzia suggests a parasitic cause of calculus.

Lt.-Colonel GILES, I.M.S., contended that the water in the stone-producing area referred to by Mr. Freyer was not derived so extensively as supposed by him from calcareous formations, but that the mountains at the sources of the Indus and Ganges were metamorphic rocks with little or no lime; gneiss and schist are the chief components of the Himalayas in the regions referred to. It was doubtful also from the analysis of the river and well waters of the north-west of India, whether there was any marked difference between the drinking water in this and other regions of India.

Dr. SIMON, C.M.G. (Singapore) stated that in the Malay Peninsula and in the Straits Settlements urinary calculi were very rarely seen. The cases he had met with during a twenty-five years' residence were few, and all importations. He had never seen a Malay afflicted with stone in the bladder.

Capt. MILNE, I.M.S., stated that in India in many calcareous districts stone was rare, and in other districts in which limestone was absent stone was met with.

Dr. LEONARD HILL (Pakhoi, China) said that in Pakhoi stone was practically unknown, whereas in Canton, some 200 miles off and in the same province, stone in the bladder was very common. In Hang-chew urinary calculi were very common, whilst in Ning-Po, close by, practically none were met with.

Dr. MOFFAT (Uganda), in giving his experiences of Uganda and East Africa in connection with the prevalence of stone, said that in Uganda the complaint was almost unknown, the only case he had seen was a phosphatic calculus in which the salts were deposited around a foreign body. There was no limestone in Uganda.

Mr. JAMES CANTLIE (London) gave an account of the difficulties attending the operation of crushing for stone in tropical countries. The perfection of the instrument had everything to do with the success of litholapaxy. Mr. Cantlie related a case in which two lithotrites he had with him went out of order and became unworkable just as crushing the stone was started. A reliable lithotrite was of primary importance in every circumstance, but it was, if possible, even more urgently required to be so in out-of-the-way districts of the tropics, where, before a new instrument could be procured many months might intervene. The indiarubber and caoutchouc materials in the tropics were apt to spoil rapidly, and no one who had any practice in litholapaxy

in the tropics, can fail to remember the anxiety with which he watched the fissures and cracks becoming deeper and deeper in the evacuating apparatus as it was being squeezed during the operation. These were two of the chief objections to litholapaxy in the more isolated parts of the world, but in large towns where renewal of instruments was possible the operation had everything to recommend it.

Professor F. M. SANDWITH, Cairo, stated that the ova of *Bilharzia* was frequently met with as the nucleus of calculi in Egypt. The question of the presence of lime in the drinking water was one which, if it had anything to do with calculi, was secondary to the establishment of a nucleus. Water supplied from the Nile is loaded with volcanic detritus and becomes charged with lime in its passage through limestone regions. The Egyptian peasants do not filter the drinking water as Europeans do in Egypt. This may be the explanation why the peasant suffers so frequently from vesical calculus.

Mr. FREYER, in reply, said that he had experienced the difficulties met with by Mr. Cantlie, and that it was important to get instruments from only the best makers—there was only one maker in England whose lithotrities could be relied on. (With this statement Mr. Cantlie agreed). The preservation of rubber material in the tropics was a question of frequent use. Were rubber used in the tropics as in temperate climates it would last as long in one place as the other.

DUST AS THE VEHICLE FOR THE GERM OF CEREBRO-SPINAL FEVER.

By W. J. BUCHANAN, M.B., D.P.H., Major, I.M.S.

MAJOR BUCHANAN commenced by referring to his former paper on the incidence of cerebro-spinal fever among prisoners engaged in different kinds of labour in the central prison, Bhagulpur.

In that paper he had described 47 cases of the disease, and he now adds 13 more, making 60 cases in all.

He is unable to trace the original source of infection in the gaol, but he finds that of the 60 cases 57 came from among prisoners working at "dusty" occupations, while only 3 cases from among prisoners whose occupations, such as weaving, &c., involved exposure to little or no dust, although a minority of the prisoners were engaged in the former occupations.

Dust from occupations is of two kinds—one, that produced in such work as that of brick-field gangs, road workmen, &c.; the other that produced in the work of wheat-grinders, rice-huskers, and the like.

Of the 60 cases, 56 occurred during the dry hot and dry cold months, which are dusty, and only 4 during the wet months, which are of course less dusty so far as dust from roads, &c., is concerned; and all these 4 came from among the grain cleaners, in whose work dust is much the same all the year round.

Long-term prisoners, engaged in spinning, weaving, and other skilled labour, escaped from the disease, and no evidence of direct contagion among the rest could be traced. A work-shed, used for the very dust-producing work of husking rice, was thoroughly

cleaned, disinfected, tarred, and lime-washed, the prisoners working there were moreover given pieces of cloth to wear as respirators, with the result that whereas during the previous year eight cases had come from the shed, during the seven months subsequent to the cleaning not a single case has come thence, though cases have occurred among the road and garden gangs as before.

Major Buchanan concludes therefore that it may justly be accepted that dust is a frequent vehicle for the germ of cerebro-spinal fever, a diplococcus, as has been proved, and offers considerable resistance to desiccation. He finishes his paper by calling the attention of tropical practitioners to the claim of cerebro-spinal fever to be reckoned with as one of the continued fevers of the tropics.

Lt.-Colonel GILLES, I.M.S., remarked that in an epidemic of cerebro-spinal fever watched by him in a jail in the N.W. provinces of India, infection appeared to cling to the building; as after emptying, cleansing and disinfecting the premises, the disease recurred, and that, too, after several such procedures.

FOUR CASES OF LIVER ABSCESS: TREATED BY TROCAR AND CANNULA AND SYPHON DRAINAGE (MANSON'S METHOD).

MR. JAMES CANTLIE gave details of four cases of liver abscess he had treated by Manson's method during the past twelve months. The 4 cases complete a series of 28 cases Mr. Cantlie has treated by this method, with 24 recoveries. Two of the cases that died were the first two he treated; the third he only operated upon but did not treat subsequently; in the fourth case the abscess was only opened for the purpose of relief, not with the idea of cure, the patient being almost comatose at the time. All four cases were intra-hepatic abscesses and all had had dysentery previously. One case was that of a soldier who went from India to South Africa where he contracted dysentery and developed an abscess after reaching England. The second case was that of a man from South Africa who developed "fever and jaundice." He had many attacks of this nature during seventeen months, during which time he saw several doctors and had many diagnoses of his case made. Some of the diagnoses were "catarrhal jaundice," "malarial jaundice," "scorbutic jaundice," gall stones, bydatids, &c. The third patient was a marine engineer from China, who after operation developed well-marked pyæmia, but made a good recovery. The fourth patient was a Zanzibaree who was admitted into hospital in a comatose state and was operated upon owing to the distress caused by the pressure of the abscess in the epigastrium.

Mr. Cantlie claimed for tapping by the trocar and cannula and the introduction of a large tube and siphon drainage as the readiest, the safest and most efficient operation for deep-seated liver abscesses. When the pus was near the surface it did not matter in what fashion the operation was performed, as the whole proceeding merely amounted to opening what often proved to be a subcutaneous, or at most a subcostal, collection of pus. But with deep abscess on the dome of the liver, pressing upwards towards the chest, operation by cutting or the "free method" was

inadvisable. Transthoracic operation by way of the pleura, the diaphragm and with excision of a piece of rib, was over-heroic surgery and quite uncalled for. It must also be remembered that operation for liver abscess was most frequently performed in the tropics, where, except in the large towns, the surgeon was often single-handed, and to undertake operations on liver abscess by laparotomy or by transthoracic incisions were proceedings that no man single-handed is justified in attempting, seeing that there is a more easy and efficient plan of treatment.

Mr. P. J. FREYER advocated operation by incision, and quoted cases in his practice whereby excellent results were obtained. He had quite abandoned operation by trocar and cannula.

Dr. G. P. JORDAN (Hong Kong) states that his colleagues and himself in Hong Kong had discarded the trocar and cannula, and now operated by either laparotomy or by transthoracic incisions. He used silver drainage tube in place of rubber, owing to the tendency of the latter to be compressed by the ribs.

Dr. CHISHOLM (Sydney) said that in Australia pus in the liver was generally secondary to hydatids, and that in these cases operations by incisions were necessary. At the same time he was glad to find that a simple method of operating for simple liver abscess was in vogue, as he was inclined to think that surgeons at the present day, especially the younger surgeons, were inclined to be over-heroic in their surgery.

Dr. MANSON, C.M.G., F.R.S., said he had seen both plans of operation followed, and he was inclined to deprecate the all too heroic methods usually practised by British surgeons. By the trocar and cannula, deep-seated abscesses could be safely reached without the complications that were almost certain to ensue by severe cutting operations.

Capt. W. R. BATTYE, I.M.S., stated that Colonel Hatch, in Bombay, had seen in several cases severe hæmorrhage follow puncture of the liver by the needle of an aspirator. He was of opinion that such hæmorrhage could be more easily dealt with if the wound in the liver had been exposed to view.

Thursday, August 1.

Mr. JAMES CANTLIE, Vice-President, in the Chair.

DISCUSSION ON MALARIA AND ITS PREVENTION.

I.—NOTES ON ANTI-MALARIAL MEASURES NOW BEING TAKEN IN LAGOS.

H.S. Sir WM. MACGREGOR, K.C.M.G., Lagos, contributed a paper dealing with the question of malarial prevention in Lagos. The two chief scourges of the colony of Lagos are malaria and dysentery and the colony spends one-seventh of its revenue in combating these ailments. As an aid towards prevention it is sought to educate the people in the colony on the subject of malarial infection, and every possible means are being taken to bring this about. The greatest attention also is being given to the prevention of malaria by the administration of quinine, to the use of gauze netting, and to the destruction of the breeding places of mosquitoes. The administration of quinine is being carried out wherever possible

and the greater number of Government officers take quinine regularly as a prophylactic. In all probability the day will come when a man who cannot, or will not, take quinine, will not be sent or allowed to remain in a malarial country. The common method in Lagos is to take daily doses of from 2½ to 5 grains. It is, however, impossible to protect the whole population by administering quinine, and the great question comes to be how to protect the native. *Mosquito netting* as a protection against malaria has the disadvantage that it renders sleeping beneath a mosquito-net almost impossible, so hot and stuffy does the atmosphere become. Muslin has the drawback that it becomes mildewed and rots, but a metallic gauze of galvanised wire netting has proved efficient and less expensive than copper wire gauze. Measures have been taken to diminish the numbers of mosquitoes, but they have proved slow, laborious and costly. The idea that Europeans should live quite apart from natives is, from the administrative point of view, unacceptable. In many inland towns there is little fever, due, no doubt, to the long continued absence of rain during the dry season, whereby the mosquito larvæ are largely destroyed.

II.—THE PREVENTION OF MALARIA IN HONG KONG.

Dr. J. M. YOUNG (Hong Kong), in a paper relating to this subject, stated that where *Anopheles* are found there is malarial fever; and that in every malarious district the parasite of malaria is found in the blood of the children resident there, that *Anopheles* had been caught in these districts, and that breeding pools occurred in the immediate vicinity. Two distinct varieties of *Anopheles* were found, namely, *A. costalis*, and *A. sinensis*. Germicides, Dr. Young considers to be only subsidiary measures for affording protection against *Anopheles*. The only permanent and effectual method seems to be clearing all long grass and undergrowth, and destroying all breeding places by draining, &c. A cleared area is of immense importance, as no mosquito will fly far, probably not more than 150 yards. Experiments have been made in Hong Kong as to the destruction of mosquitoes and their larvæ by the "natural enemies of mosquitoes," dragon flies, tadpoles and small fish. Dr. Young placed twenty *Culex* and twenty *Anopheles* larvæ together in water and found that the *Culex* larvæ completely destroyed the *Anopheles*.

III.—INOCULATION OF MALARIA BY ANOPHELES.

CAPT. C. F. FEARNSIDE, I.M.S., contributed a paper on experiments carried out in the Central Prison of Rajahmundry, Madras Presidency, one of the most malarial jails in India. Infected mosquitoes can only infect a limited number of persons, and to give a successful inoculation a considerable number of parasites must find their way into the blood, otherwise the blood phagocytes destroy them. Of *Anopheles* fed on persons suffering from malaria, 70 per cent. approximately became infected. Eight persons were inoculated by these mosquitoes, and seven contracted fever. The inoculation period proved to be twelve to twenty-five days for parasites of the summer-autumn and tertian varieties. The prevention of the spread of malaria by means of proof houses and mosquito-

curtains, is out of the question in India, as far as natives are concerned. The destruction of *Anopheles* presents many difficulties, and segregation and the free use of quinine are also attended by almost insurmountable obstructions.

IV.—NOTES ON CYPRUS FEVER.

Dr. GEO. A. WILLIAMSON (Larnaca, Cyprus) stated that the majority of fevers in Cyprus were malarial, and that but few were of the nature of Malta fever with which so-called Cyprus fever was often confounded. The principal types of malarial fever in Cyprus are tertian and quartan and their double varieties. Pernicious malarial fever is now, owing to drainage, &c., less frequently met with than in former days. Most of the mosquitoes in Cyprus belong to the *Culex* tribe.

V.—MALARIAL AND FILARIAL DISEASES IN BARBADOS, W.I.

Dr. GEO. C. LOW, at present in Barbados, engaged in investigating the diseases of the Colony, contributed a most important paper on these subjects. There are neither malaria nor *Anopheles* mosquitoes in Barbados. Filarial diseases and the *Culex* mosquito abound and probably stand to each other as cause and effect. Dr. Low is of opinion that owing to the excellent water supply which is laid on to the houses, the breeding ground of the *Culex* mosquito in the pools and tanks round dwellings can be done away with. The result of this simple step would be the extermination of filariasis and filarial diseases.

DISCUSSION ON THE PAPERS ON MALARIA.

Professor R. BOYCE (Liverpool) was convinced that any measures adopted in West Africa, whereby the natives were not protected as well as the Europeans, would not meet with the approval of British West African merchants. He believed that extirpation rather than segregation would be productive of the greatest good.

Dr. EDWARD HENDERSON (Shanghai) said that the tertian type of fever prevailed in Shanghai. He believed that the adoption of preventive measures by Europeans in China would set a good example to the Chinese, but it seemed a hopeless task to get preventive measures against malaria to be adopted throughout the length and breadth of China.

Dr. MANSON, F.R.S., stated that the adoption of any one method of destroying mosquito larvæ, to the exclusion of all others, was to be deprecated. Different measures applied to different places. The preventive treatment of malaria by quinine was inapplicable for large populations, but for small communities the plan was possibly expedient.

It seemed an impossible task to compel negroes to take quinine, and the plan recently adopted with that intent by the German Government seemed bound to fail. Dr. Young had referred to the destruction of anopheles by *Culex* larvæ when placed together. No doubt this was true when food was scarce, but when food is plentiful the two live amicably side by side. In several parts of the world malaria was absent and in others it prevailed; in some places anopheles existed and in others culex,

and yet in a third place the two existed side by side. Could we find out why anopheles lived in one place and not in another, why certain diseases prevailed in one place and not in another, we should be able to attack the mosquito with destructive measures of a natural type, instead of by the chemical and mechanical methods now employed. We had analogies of diseases in plants being thus combated as in the case of the disease of the vines in France, and the orange trees in the United States of America. He objected to any plan of defeating malaria being condemned simply because it was not perfect. An abatement of the disease was a most desirable object and one which should be aimed at when the more radical measures proved impossible.

Col. POYNTER, I.M.S., held that it was impossible to teach the natives of India preventive measures for either cholera or malaria; for they would even drink water after being warned that it would give rise to cholera.

Mr. CANTLIE stated that he considered the "Swatow Mosquito" lamp used in China a most efficient method of getting rid of mosquitoes within a mosquito net, and that he had induced an instrument maker to make the lamp so that now it could be obtained in London.

NOTE ON THE ENTRANCE OF ANKYLOSTOMA EMBRYOS INTO THE HUMAN BODY BY MEANS OF THE SKIN.

PROFESSOR F. M. SANDWITH (Cairo) read a paper on this subject and stated that it has long been known that ankylostomiasis infection can occur by the mouth, but the intention of the present paper is to draw attention to Dr. Looss's discovery that the embryos have also the power of entering the skin, chiefly by the hair follicles.

In 1898 Dr. Looss announced this fact, but as there is no analogy for a parasite behaving in this way, his paper met with no reception beyond a little hostile criticism.

Like many scientific discoveries, this was the result of a pure accident. While working in the laboratory of the Cairo Medical School, a drop of pure culture of embryos fell on his hand; he happened to examine the drop some minutes later and was astonished to find that it contained countless empty embryo sheaths and a few sluggish embryos. The bulk of the embryos had apparently entered the skin. His hand became red and burning and he found himself later suffering from anæmia and debility with evidence of ankylostoma infection in the faeces requiring a prolonged cure. Since then a similar experiment has been made on a human leg one hour before amputation. Sections of the skin showed that the embryos had entered chiefly by the hair follicles. Inside the follicle the embryos push their way towards the hair papillæ during which process, if there are many in the hair follicle, the root sheath of the hair is almost completely destroyed. When the papillæ are reached, the embryos leave the hair follicle to pierce the surrounding tissue of the true skin. (*Centralblatt für Bakteriologie*, May 31 and July 5, 1901).

A section under the microscope and some micro-

photographs show many embryos in different stages of entry. It is assumed that the embryo finds his way from the skin to the small intestine; but of this there is as yet no proof.

Dr. Looss's researches throw an additional light upon ankylostomiasis infection in many countries, and may lead to an analogous discovery with regard to Bilharziosis, and perhaps other parasites.

Lieut.-Col. G. M. GILES said that he had seen Dr. Looss's specimens in Cairo, and he could confirm all that Professor Sandwith had stated. There is now no doubt that the ankylostoma embryos can enter the skin by way of a hair follicle, but how the ova came afterwards to infect the intestine in the numbers they do can hardly be explained by this method of infection. Col. Giles believes that the parasite gains entrance as ova amongst the dirt on the hands of the coolies in India. The soil is impregnated with these ova especially in the tea-gardens of Assam, and when with unwashed hands the coolie conveys his food to his mouth the ova enter with it and are swallowed.

Dr. MANSON regarded the specimen exhibiting the embryo ankylostome entering a hair follicle rather as a curiosity, and would deprecate premature interpretation of the fact as indicating a phase in the normal life history of the parasite, or as a method of infection. The active embryo placed on the skin possibly enters the hair follicle for shelter merely. He suggested that the entrance of the embryos of ankylostomata by the skin should be made the subject of closer research, and the experiments might, with advantage, be conducted in this country where the chance of previous infection was *nil*.

DISEASES OF BADAGRY, LAGOS.

By W. F. MACFARLANE.

Assistant Colonial Surgeon, Lagos, West Africa.

I was brought in contact here with most diseases prevalent on the coast; observing cases of fever, dysentery, diarrhœa, ankylostomiasis, foul gangrenous ulcer, yaws, ainhum, craw-craw, guinea worm, ringworm, elephantiasis, leprosy, &c., &c.; but especially would I like to bring forward as most prevalent, and remarkable to this district, dysentery, diarrhœa, ankylostomiasis, foul gangrenous ulcer, the jigger, the mosquito, a peculiar poisonous green fly, and a marked tendency to ptosis on the part of the inhabitants.

DYSENTERY AND DIARRHŒA.

Dysentery is probably more common here than in any other part of the Colony. It is generally of a catarrhal type. There are frequent loose motions at first, later becoming mucoid and bloody, with great tenesmus and griping. The disease, however, is amenable to treatment, and patients rapidly recover under suitable dietary and drugs, and there is but little tendency to chronicity or ulceration (natives). I may state that I have never seen a case of abscess of the liver in a native in the Colony, though dysentery is so prevalent.

A diarrhœa taking on peculiar symptoms I first observed at Badagry, and as since then I have seen

two cases exhibiting the same symptoms, I take it that this form is pathognomonic, and will describe it. All these cases occurred among Europeans.

The disease begins with premonitory diarrhœa in a patient who was previously in good health. He passes two or three loose motions a day with slight tenesmus. Under ordinary treatment the symptoms improve, but a day or two after, being, as he thinks, practically well, he wakes one morning with a griping pain in the abdomen and rises to go to stool. He passes a small scybalous motion which is bathed in, and followed by, about two drachms of a dirty milky looking fluid. In the afternoon or evening he again experiences the uncomfortable feeling in the abdomen, and another motion of like nature is passed, or perhaps only a little of the fluid.

Except for the discomfort previous to going to stool he keeps in good health. This state of affairs continues for a few days, when he has a larger motion, containing ordinary fæces but followed by a drachm or two of the buff fluid. In the mean time the patient has been eating his ordinary food and sleeping well at nights. The disease is most chronic. The gut may take on its natural function for a week or ten days and then the old trouble starts afresh. It generally lasts for months. Its remission, chronicity, resistance to treatment, and its not appreciably conducing to physical ill-health, are its marked points. After following out various lines of treatment with indifferent success, I found the following formula was useful, but had to repeat the mixture in a fortnight.

R	Liquor Bismuthi	..	..	1 dr.
	Magnesi Sulphas	..	..	60 grs.
	Liquor Hydrargyri Perch	..	..	1 dr.
	Aqua Chloroformi	..	..	ad. 1 oz.
	ft. mist.			
	1 oz.	ter in die.		

Concurrent with the mixture 5 grs. of quinine was taken each night, rest prescribed, and alcohol and all irritating articles of diet avoided.

It is difficult to determine the causes of this peculiar intestinal disturbance. The factors, I should say, judging from the nature of the stool, lay in glandular enlargement not going on to ulceration. Whether the mischief is brought about by protozoal, or bacterial origin, or by a simple mechanical irritation, I am unable to fathom. Talc, which is common, could, by being swallowed in the water, account for very severe irritation. Small quantities of this substance, by reason of the plate-like flat surface of the particles, and their lightness, would adhere firmly to the walls of the bowel and be difficult to dislodge.

ANKYLOSTOMIASIS.

Most common in this district. Patients frequently came to me suffering from anæmia, with puffy faces and ankles. These I generally found to be suffering from ankylostomiasis. Unfortunately, not being in possession of a suitable microscope at the time, I was unable to examine the fæces for the ova of ankylostomum duodenale, but excluding beri-beri (the paralytic symptoms of this disease not being present) and malaria (there being no marked

history of fever), I first treated for ankylostomiasis with thymol, and almost invariably ankylostomum duodenale were passed, and the patient rapidly improved.

One case under my observation and treatment was remarkable, showing what grave symptoms this parasite can produce, and how rapid is the recovery on its expulsion.

A child, aged 4, was brought to me with marked ascites as the prominent symptom. On closer examination I found also effusion into the pleural cavity. Heart sounds and præcordial dulness, normal, no albumen in urine, liver as far as could be judged not enlarged. There was also anæmia, and the ankles were swollen. The history that could be elicited from the mother was vague. Evidently the child had been ailing for the last five or six months; the swelling of the abdomen had been only noticed during the last month. The ascites was so advanced that I raised the question as to the advisability of tapping. Mindful, however, of a somewhat similar case that came under my charge when Resident Medical Officer at the Lagos Hospital, and which, by the advice of Dr. Strachan, the Chief Medical Officer, I first tried for ankylostoma and with success, I resolved to carry out the same lines of treatment here, and first exclude the possibility of the parasite being the primary factor of the present trouble. Having prepared the patient by a light diet of diluted agidi for two days, I exhibited thymol, giving 7-grain doses every three hours for four doses, the bowels having been previously cleared out with castor oil, and a dose of oil also following the last dose. He passed that evening several light coloured motions containing large quantities of ankylostoma. The patient was now put on iron for four days (Parish's chemical food), after which the thymol treatment was again continued, and again worms were expelled. After the fourth such treatment none, however, were found, and the vermifuge was discontinued, and the tonic line of treatment pressed. The little fellow was rapidly improving in the meantime, and the change in his condition was really remarkable. The abdomen became soft, and reduced in size, the swelling of the feet also rapidly subsided, the cachexia diminished, and each day he showed an improvement on the last. In a month after treatment he was able to run about, though he was kept on iron for another month.

Geophagy I found very often associated with ankylostomiasis.

So frequently are ankylostoma found in fæces of patients suffering from earth eating, cachexia, or dropsical effusions, that except when pronounced symptoms of beri-beri are manifest, or anæmia from any evident cause, it seems sound on the coast to bear ankylostomiasis in mind. Even where beri-beri is suspected ankylostoma will often be found.

That the geophagy should so often accompany this disease, and *vice versa*, is curious. Which is primary?—the existence of the worm in the bowel causing the depraved appetite, or the ova of the worm introduced in contaminated earth into the alimentary tract? In both cases anæmia results, both often co-exist, the parasite and the earth-eating habit; the discolouration of skin said to be peculiar

to geophagy I have never found. The earth eaten is of two kinds, the white and the red, and both are found in damp places. The probability is that in *all* cases of geophagy, if any symptoms arise, the ankylostoma duodenale ova has been swallowed in the earth.

It is curious that Europeans on the coast do not suffer from ankylostomiasis. This can perhaps be accounted for by the fact that Europeans* boil their drinking water, and that the ova, unlike those of *ascaris lumbricoides*, are destroyed by heat.

JIGGER.

The jigger is the common pest of Badagry and district, very few escaping for many days without becoming a victim, even Europeans, taking due precautions, not being exempt. The usual history is that an intense itching is experienced, generally in the skin at the root of the nail of one of the toes. On examining the seat of irritation nothing much is to be seen; a small dark speck in the skin, surrounded by a slight areola of inflammation only being apparent. This can always be observed, even in the skin of a dark native. So well known is the insect in the district, that the sufferer at once diagnoses the case, and proceeds to treatment. As the native is an adept at this little operation, I will describe it as conducted by himself. Having procured a sharp needle, he gently digs and scratches away the epidermis above and around the dark speck, and soon comes to a buff-coloured round object, varying in size from a pin's head to a small pea, with the black dot apparently adhering to its surface. He has worked down so carefully that he has not injured the round body in any way. Now the operator skilfully passes the point of his needle around and under the tumour, and enucleates it entire and whole. The skill lies in removing the body without causing an unnecessary wound, and also in getting it away entire; for should it be punctured scores of minute ova, resembling the small bodies composing a hard fish roe, are liberated, and though they are scraped out to the best of the operator's ability, a nasty ulcer is liable to form.

Probably the round tumour is the abdomen of the impregnated female jigger, and the black speck its head and thorax. When the abdomen is ruptured the ova escapes into the wound made in the skin. I found that if the part was bathed in a strong solution of perchloride of mercury no bad effects followed this accident. The natural surroundings at Badagry are peculiarly favourable for the growth and development of the jigger. Streets ankle deep with warm sand, moist atmosphere, and proximity to lagoon.

The jigger sometimes causes serious trouble. I have seen cases where the whole surface of one of the toes was ulcerated, swollen, and of a clubbed shape, with the broad end at the ball of the toe. These ulcers emit an extremely offensive odour, as

* Also in the fact that the Europeans here do not eat their food with their hands unwashed after handling earth. When this is done, as in the construction of railway tunnels, &c., by Europeans in certain parts of Europe where ankylostomes exist, ankylostomiasis results.—Ed.

the result of non-cleanliness. Complete immersion of the foot in carbolic acid lotion (1 in 40) for a few days, and then dressing with iodoform and boric acid, answers well. The natives frequently lose their toes through this source, and ainhum is not alone accountable for the large number of feet one sees with a toe missing.

MOSQUITOES.

Mosquitoes and sand-flies abound in this district, and indeed it could not be expected otherwise, so favourable for their well-being is the spot. A stream runs behind the town with numerous swamps in its vicinity, and with many suitable puddles for the development of the larvæ; in front lies the lagoon also with swampy land adjoining in places. —*Annual Medical Report for 1889.*

(To be continued.)

THE PROPOSED WEST AFRICAN HEALTH AND SANITATION COMMISSION.

APPOINTMENT OF MAJOR ROSS AS SCIENTIFIC EXPERT.

A CONFERENCE convened by the African Trade Section of the Incorporated Chamber of Commerce of Liverpool was held on July 3, in the Board-room of the Chamber of Commerce. Mr. Alfred L. Jones, Chairman of the Section, presided, and there were also present, representing the African Trade Section of the Liverpool Chamber of Commerce, Messrs. John Holt (Vice-Chairman), Louis Solomon, W. D. Woodlin, A. J. Fontannaz, and James Irvine; representing the West African Trade Section of the London Chamber of Commerce, Messrs. F. Swanzy (Chairman), J. H. Batty, and H. Wallach; representing the African Sectional Committee of the Manchester Chamber of Commerce, Messrs. J. A. Hutton (Chairman), Thomas Welsh, and F. Burman; and Thomas H. Barker, Secretary, Liverpool Chamber of Commerce.

The business discussed had reference to an important proposal made by the Rt. Hon. J. Chamberlain, when he received a deputation from the African Trade Section in March last, relative to health and sanitation in West Africa. The proposal was that the three Chambers of Commerce represented, viz., those of London, Liverpool, and Manchester, should each appoint one of their number to be a member of a commission which should go out to the West African Colonies and inquire into their sanitary condition, the measures that seemed feasible to improve the health of the inhabitants, the probable cost of such measures, and the best way of raising funds to meet it. In addition to these three gentlemen, the Commission should include someone representing the Colonial Office, and a scientific expert nominated by the Chambers.

The first question raised by the Chairman was as to what was to be done in regard to the arrangements for carrying into effect the proposals of H.M. Secretary of State for the Colonies, viz., whether it should be recommended that the Commission should be appointed to proceed to each of the colonies separately, or one Commission to proceed to the whole.

Mr. SWANZY (London) thought that a separate Commission should be sent to each colony.

Mr. WELSH (Manchester) thought that the time required for the Commission to proceed to all the colonies would not be very great, and stated that there were only two ports, Freetown and Sherbro, in the Colony of Sierra Leone, which would require to be visited. The chief difficulty in the way of the speedy accomplishment of the objects of the Commission would be found in Southern Nigeria, owing to there being several centres—Calabar, Benin, Brass, Opobo, &c.

A further discussion as to the time which would be required for the Commission to report on all the colonies followed. Mr. Welsh thought that four to six months would be sufficient. Mr. Solomon here interposed, saying that he thought the conference should first nominate the mercantile members of the Commission, and afterwards discuss the other details, such as the time required for their work, &c. The following gentlemen were then nominated to represent the commercial interests of the three Chambers concerned, viz., Mr. C. Tambacci for Liverpool; Mr. Thomas Welsh for Manchester; and Mr. J. H. Batty for London.

Mr. BATTY, on behalf of the London Chamber, suggested October next as a suitable time for the Commission to leave England.

The nomination of a scientific expert suggested by Mr. Chamberlain was next considered, and it was unanimously agreed to nominate Major Ronald Ross as Medical Officer. It was afterwards suggested that a sanitary engineer should be appointed as well as a medical officer, and it was resolved that this suggestion should be communicated to Mr. Chamberlain, who should be asked to consent to this addition to the Commission. In his letter to Mr. Chamberlain the Secretary to the Liverpool Chamber of Commerce says:—

"Health and Sanitation Commission, West Africa.

"I am directed to inform you that a Conference of representatives of the African Sections of the Liverpool, London, and Manchester Chambers was held here to-day, under the Chairmanship of Mr. Alfred L. Jones, to consider further in detail your suggestions on the above subject made to the deputation from the Chambers on March 15 last. The following gentlemen were nominated by the conference to represent the three Chambers as the mercantile members of the proposed Commission, viz., Liverpool, Mr. C. Tambacci; London, Mr. J. H. Batty; Manchester, Mr. T. Welsh, subject to the approval of the respective Chambers.

"In regard to your suggestion that a scientific expert should be nominated by the Chambers to accompany the mercantile delegates, I am to say that Major Ronald Ross was nominated as the medical officer of experience in that capacity. Further, it was agreed to be desirable that a sanitary engineer should accompany the Commission; and I am to ask whether, if such an expert be nominated, you can see your way to confirm the appointment. It was suggested that the month of October would be a suitable time for the departure of the Commission."

Mr. HUTTON (Manchester) suggested that the

Chambers of Commerce on the West Coast should be written to in order to prepare them for the arrival of the Commission, and to facilitate its objects. The suggestion was approved.

It was suggested by Mr. WALLACH (London) that the Hamburg and other Chambers should be informed of the steps that are being taken, in order to give them the opportunity of following the example set by His Majesty's Government on matters relating to the health of the coast.

A luncheon, over which Mr. Alfred L. Jones presided, followed the meeting, and was attended by the delegates at the conference—Mr. Thomas, of Sierra Leone; Professor Boyce, of the Liverpool School of Tropical Medicine; and others.

AMERICAN PEDIATRIC SOCIETY.

Thirteenth Annual Meeting, held at Niagara Falls, N.Y., May 27, 28, and 29, 1901.

AN ACCOUNT OF EPIDEMIC MALARIA IN CHILDREN.

DR. R. G. FREEMAN, of New York, presented this paper. The cases were seventy-seven in number, and occurred in the children of the New York Foundling Asylum occupying a certain play-room. Though there were 700 children in the institution, no others were affected. Those in the nursery-room above did not have it. The temperature ranged from 100 to 105 degrees F. All had coated tongues, not red at the edges as in intestinal disorders. None had large spleen. All were given castor oil and put on milk diet. The blood of seven was examined, with negative results at first, though in one instance plasmodium was found later. All received grs. 2 of quinine three times a day, and the temperature fell in twenty-four hours. The oil alone did not cure, so the disturbance was not intestinal. Adjoining the play-room was an excavation, where rains formed stagnant pools. These were present too short a time to permit the development of *Anopheles*, and neither mosquitoes nor bites were found on the children.

Dr. NORTHRUP told of a case of suspected malaria in an infant of 9 months, in which the bacteriologist actually killed a mosquito on the infant.

Dr. PACKARD said that the *Anopheles* appeared in Philadelphia about June 15. As influenza had previously prevailed, weakened power of resistance might be a factor.

Dr. KERLEY reported that he had examined the blood of fifty children with elevated temperature. None had plasmodium, but all got well on quinine and proper diet. He did not diagnose the trouble as malaria.

Dr. ADAMS did not consider that malaria was proven, nor evident, except in one case. He saw many cases in Washington, and found the astivo-autumnal variety required more quinine than others.

—*Medical Record*, June 29, 1901.

SANITATION IN EGYPT.

FROM an article in the *Empire Review* for March, 1901, concerning "What British Administration has done for Egypt," by W. F. Miéville, we gather the following information:—

"Nor has the work of sanitation been neglected, but the carrying out of this reform has been uphill work. Orientals, though not uncleanly, seem unable to grasp the meaning of the most elementary rules of sanitation. Great strides, however, have been made in this direction. Stagnant ponds, such fruitful sources of disease, have been filled up, and cemeteries moved to healthy sites. The drainage of the mosque latrines into the Nile and canals is now prohibited, and proper reservoirs are substituted for the open ablution basins so common in mosques. Efficient doctors are placed in charge of the hospitals, proper ventilation provided and thorough cleanliness enforced, while public disinfecting stations and separate pavilions for infectious diseases have been erected. But in spite of all that has been done much remains to be accomplished. Reform in quarantine matters has proved even more difficult than reform in sanitation, as the Quarantine Council is an international body in the sense that no less than fourteen different Powers are represented thereon. Patient work combined with a modicum of diplomacy, however, has borne its fruit. The old vexatious and absurd regulations have for the most part been swept away, and the common-sense principle now prevails of treating vessels according to whether they have or have not actual disease on board at the time of arrival in Egyptian waters instead of, as in former times, condemning a vessel as foul simply because she had happened to sail from an infected part."

THE Plague has appeared in Honolulu. Major Blair D. Taylor, of the Army Medical Department, reports that there were four deaths from bubonic plague at Honolulu from May 29 to June 9. His report says that the Honolulu Board of Health has taken every precaution to segregate the inhabitants of infected houses and disinfect them, and the President of the Board believes that he has the situation well in hand. At Hong Kong the disease has broken out in virulent form, and every port in the Orient has quarantined against that place. A United States transport, having on board 180 soldiers and sixteen officers, returning from the Philippines, was detained at Nagasaki on account of the death from plague of a Chinese fireman. At Hong Kong, since the first of the year, seven Europeans and 542 natives have died of the plague. A British steamer is in quarantine at San Diego, Cal., having lost six of her crew from plague during the voyage from Hong Kong. One death occurred before Honolulu was reached, and five between that port and San Diego. The cases were not confined to any part of the ship, various members of the crew and one steerage passenger being among those attacked. Many dead rats were found in the ship.—*Medical Record*, June 29, 1901.

HOW PLAGUE IS REPORTED IN CAPE COLONY—A CURTAILED SPECIMEN OF THE WEEKLY BULLETIN.

N.B.—The analysis of Males and Females under separate races is omitted in this reproduction owing to want of space in the Journal.

Sir,—I have the honour to inform you that the following is the report on the state of the outbreak of Bubonic Plague in the Cape Colony, for the week ended July 6, 1901, namely:—

PARTICULARS	THE COLONY					CAPE PENINSULA					PORT ELIZABETH					HARMON, 1; IMVANA, 1; MAFFIKING, 2; SOMERSET WEST, 4; SOMERSET WEST STRAND, 1; STELLENBOSCH, 1.								
	Total— All races	Males	Females	European	Coloured	Native	Total— All races	Males	Females	European	Coloured	Native	Total— All races	Males	Females	European	Coloured	Native	Total— All races	Males	Females	European	Coloured	Native
Remaining under treatment at end of last week	60	47	13	22	32	6	53	40	13	18	30	5	7	7	..	4	2	1	..	..	..	..	..	..
Admitted	8	7	1	2	2	4	3	3	..	1	1	1	5	4	1	1	1	3	..	..	..	..	..	..
Found dead	3	3	..	1	2	..	2	2	..	..	2	..	..	..	..	..	..	..	1	1	..	1	..	..
Died, including cases found dead	4	4	..	1	2	1	3	3	..	..	2	1	..	..	..	..	..	..	1	1	..	1	..	..
Discharged cured	8	5	3	2	5	1	8	5	3	2	5	1	..	..	..	..	..	..	..	..	..	..	..	..
Remaining under treatment	59	48	11	22	29	8	47	37	10	17	26	4	12	11	1	5	3	4	..	..	..	..	..	..
Suspects remaining under observation at end of last week	12	9	3	6	2	4	12	9	3	6	2	4	..	..	..	..	..	..	..	..	..	..	..	..
Admitted	8	3	5	6	2	..	8	3	5	6	2	..	..	..	..	..	..	..	..	..	..	..	..	..
Discharged	5	4	1	1	1	3	5	4	1	1	1	3	..	..	..	..	..	..	..	..	..	..	..	..
Found to be suffering from plague	1	1	..	1	..	..	1	1	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Died of plague .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Died from other causes ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Remaining under observation	14	7	7	10	3	1	14	7	7	10	3	1	..	..	..	..	..	..	..	..	..	..	..	..
“Contacts” remaining under observation at end of last week	492	264	228	96	314	82	473	254	219	89	306	78	19	10	9	7	8	4	..	..	..	..	..	..
Admitted	67	42	25	17	43	7	54	33	21	17	37	..	13	9	4	..	6	7	..	..	..	..	..	..
Discharged	268	154	114	33	153	82	254	147	107	28	148	78	14	7	7	5	5	4	..	..	..	..	..	..
Found to be suffering from plague	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Died of plague .. .. .	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Died from other causes ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Remaining under observation	291	152	139	80	204	7	273	140	133	78	195	..	18	12	6	2	9	7	..	..	..	..	..	..
Total cases to date	760	556	204	196	408	156	727	526	201	185	401	141	23	20	8	6	6	11	10	10	..	5	1	4
Total deaths to date	361	257	104	65	229	67	350	248	102	63	226	61	9	7	2	1	8	5	2	2	..	1	..	1
Rate of mortality per cent.	47·5	46·2	51·0	33·2	56·1	42·9	48·1	47·1	50·7	34·1	56·4	43·3	39·1	35·0	66·7	16·7	50·0	45·6	20·0	20·0	..	20·0	..	25·0

I have the honour to be, Sir,
Your obedient servant,
A. JOHN GREGORY.
Medical Officer of Health for the Colony

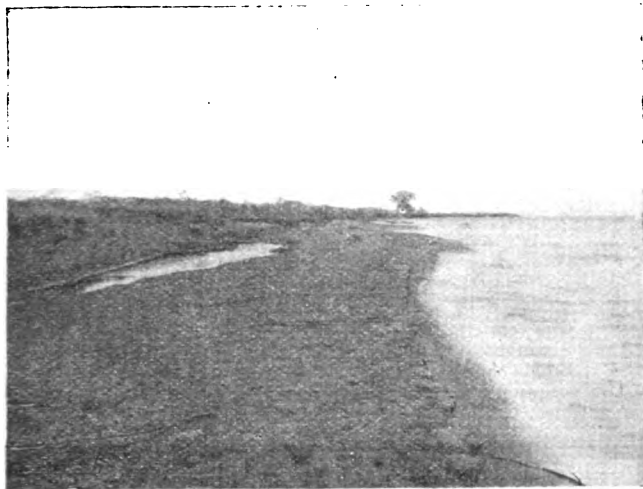
To.....

News and Notes.

MOSQUITO BREEDING PLACES.—The two accompanying photographs (reproduced by permission from *West Africa*, May 11, 1901) will prove of interest to all those who are engaged in attempts to exterminate mosquitoes by destroying their breeding places.



A GRASSY HAUNT OF MOSQUITOES IN THE SHIRE RIVER.



BREEDING GROUND OF THE MALARIAL MOSQUITO ON THE SHORE OF LAKE NYASSA.

The magnitude of the task may be gauged and its difficulties appreciated by glancing at the photographs.

LECTURE ON THE MALARIAL MOSQUITO.—Major Ross gave a lecture on July 18 on the malarial mosquito, in the Wilberforce Hall, Freetown, the Governor presiding. A resolution was unanimously passed in support of the efforts of the Liverpool malarial mosquito expedition, whose *employés* are engaged all over the town in destroying the breeding places of the insect.

Current Literature.

MALARIA.

THE TRANSPORTATION OF MOSQUITOES IN BAGGAGE—A POSSIBLE EXPLANATION OF SOME EPIDEMICS OF OBSCURE ORIGIN. By V. Havard, M.D., Surgeon U.S. Army.—Concerning the part played by the mosquito in the transmission of malarial fever and yellow fever, the following extract from a letter recently received is interesting and throws a side-light on what sceptics call the difficulties of the doctrine. The writer of this letter (Dr. L. S. Harvey, U.S.A.) is a very intelligent, well-informed observer, and, I believe, entirely trustworthy.

"In regard to the possible carrying of infected mosquitoes in baggage I had an experience last fall, which, while perhaps frequently observed, may be of interest at this time. A chest packed by me was left open for many days prior to my leaving Baracoa, in a room where there were many *Culex* mosquitoes. The chest was closed, covered with a tightly fitting canvas cover and roped, and was not opened until my arrival in Washington some sixteen or seventeen days later. When the chest was opened, I distinctly saw at least three mosquitoes of the well-known Baracoa variety fly out of the trunk. This may be a common experience, but since the mosquito theory has been promulgated, I have frequently thought how easy it would be to account for the outbreak of yellow fever at Fort Monroe by just such an experience as mine."

This observation is particularly interesting to those of us who have followed Major Reed's experiments in Havana and have become convinced that the mosquito, or rather one species of mosquito, is the usual and probably the only transmitter of yellow fever, at least in Cuba. It explains the breaking out of this disease in places not known to have been infected, and those rare cases occurring at points far removed from foci and attributed to tainted clothing or other formites.

This observation also invites attention to our own experience of the physical endurance and resistance of mosquitoes, especially in tropical or semi-tropical regions where they exhibit a nimbleness, swiftness, and longevity unknown in more northern climes. Thus, who has not slapped a mosquito with such force as to break one or more of its legs and bruise the abdomen, and, on lifting hand or finger, has not been surprised, and not a little provoked, to see the insect wriggle off and fly away? If, while a trunk is being packed and left open for that purpose, mosquitoes light in it, it is not unlikely they may become caught between the folds or layers of clothing, and I doubt very much whether the usual amount of pressure put upon the contents of a trunk, when closing it, will destroy those which have found refuge in the many spaces existing in corners, inside the trays, or between garments.

It then clearly behoves all who live in or near foci of yellow fever, malarial fever, or filariasis to exercise some caution in packing trunks, chests, and boxes, so that the existence of these diseases may not constitute a sufficient reason for the continua-

tion of the very troublesome and more or less destructive process of steam and formaldehyde disinfection.—*Med. Record*, June 22, 1901.

MAJOR ROSS, F.R.S., ON THE DISCOVERIES OF PROFESSOR GRASSI.—In *Il Policlinico*, May 10, 1901, Major Ross repudiates as untrue the following assertion of Grassi: (1) That he exhibited one of Grassi's preparations at a London medical meeting. (2) That he asserted that he had succeeded in infecting people by the drinking of water. (3) That he asserted that his grey mosquitoes transmitted tertian fever. (4) That he did not complete the cultivation of the human parasites in India because he was not able to do it. B. Grassi replies at length and still holds to his former conviction.

HAMLET'S AGUE PILLS.—

Take of—

Sulph. quinine	..	..	..	..	2 drs.
Powd. myrrh	..	..	..	..	1 dr.
Powd. capsicum	..	..	..	..	1 "

Mix. Make sixty pills.—*Indian Med. Record*, June 19, 1901.

DYSENTERY.—

R Sodii sulphat.	..	..	..	..	80
Aque destil.	..	..	..	..	90

M. S. A soup-spoonful three times a day.—*Med. Times and Hosp. Gaz.*, July 6, 1901.

PLAGUE.

WATER WASTE.—Mr. De Winton writes: "I saw it stated in a medical journal lately that the provision of a water-supply under pressure to towns often increases rather than diminishes their unhealthiness because of the woeful waste that goes on, and the numerous puddles of water all over the place, these forming breeding places for mosquitoes. This could be stopped by making the people pump their water by hand, which would be no more labour than they are accustomed to when drawing water from wells.—*Indian Engineering*, June 15, 1901.

A BUST of Dr. Armaner Hansen, to whom is due the honour of having discovered the bacillus lepra, will shortly be unveiled and placed in Lungegaards Hospital, Bergen. Professor R. Virchow, President of the Committee, is forwarding invitations to all the medical men of renown to attend the ceremony of unveiling the bust.

Letters, Communications, &c., have been received from:—

- B.—Dr. Chas. Begg (Bath); Dr. E. B. Barnet (Havana); Dr. James Berry (London); Dr. O. Baker (London).
- C.—Dr. Attilio Caccini (Rome); Dr. E. J. Cowen (India).
- E.—Dr. M. D. Eder (Palmira).
- G.—Dr. B. Grassi (Rome).
- H.—Dr. Stanford Harris (Gümar); Dr. A. H. Hanley (Dublin); Dr. Robert Howard (Essex).
- L.—Dr. Ovideo Lemas (Sao Paulo); Dr. D. Landsborough (Kilmarnock).
- M.—Dr. Patrick Manson (London); Dr. Neil Macvicar (Blantyre); Dr. J. Moore (Texas); Dr. Marks (Brisbane).
- W.—Lt.-Col. H. R. Whitehead, R.A.M.C. (Punjab).

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Exercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
Public Health.
Revista de Medicina Tropical.
Revista Medica de S. Paulo.
The Hospital.
The Medical and Surgical Review of Reviews.
The Northumberland and Durham Medical Journal.
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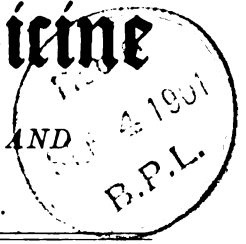
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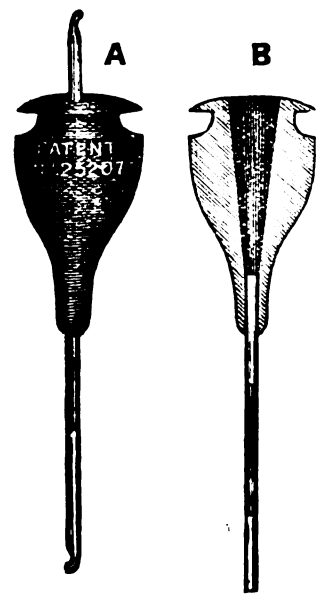


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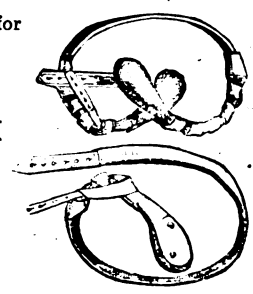
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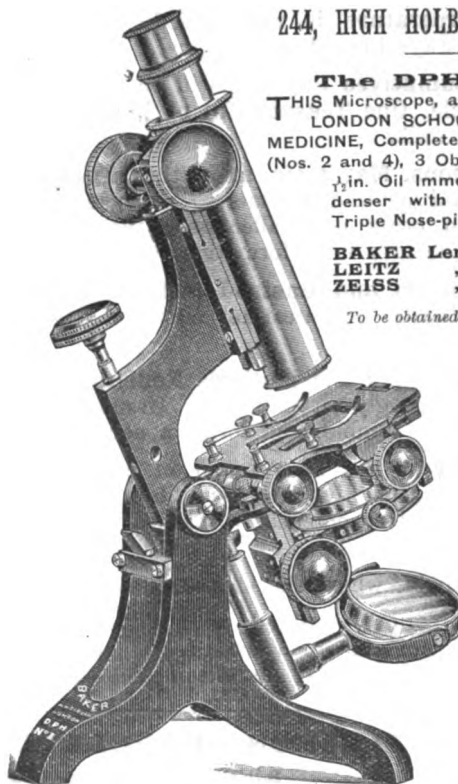
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AN ADDRESS DELIVERED AT THE OPENING OF THE SECTION OF TROPICAL DISEASES.

By RONALD ROSS, F.R.C.S., F.R.S., MAJOR, I.M.S. (Rtd.)
Lecturer in Tropical Medicine, University College, Liverpool.

I BEG to express my regrets that I am unable to present my address to the Section in person.

I have great pleasure in being able to record for the last year a general and perhaps unparalleled advance in our knowledge regarding tropical diseases.

Yellow Fever.

The discovery of at least one mode of infection in yellow fever—a discovery of the highest importance to mankind—emanates from America. For some time past several of our American colleagues, stimulated by recent observations in connection with malaria, have sought an experimental verification of the hypothesis of Finlay and others, that yellow fever also is communicated by the bite of gnats. Insects fed on patients were subsequently induced to bite healthy persons who volunteered for the experiment. The results were negative until the gnats were kept for an interval of twelve or more days between the two operations. Success was now immediate. Drs. Reed, Carroll, and Agramonte record in their last report that out of seven non-immune persons subjected by them to the bites of infected mosquitoes, six yielded undeniably positive reactions. At the same time, seven non-immunes whom they endeavoured to infect by means of the fomites of patients under peculiarly favourable circumstances, remained in every case free from the disease.

The experiments were conducted under the most stringently scientific conditions. Although the mosquito theory of yellow fever does not possess the parasitological basis of the mosquito theory of malaria, yet the differential observations of Reed, Carroll, and Agramonte are of a nature to leave no doubt concerning the soundness of their conclusions.

Some of the tests have involved great heroism on the part of those who were subjected to them. Since the death of Dr. Jesse W. Lazear we have to deplore that of Dr. Walter Myers, one of our most promising young pathologists, who lost his life from yellow fever when on a deputation from Liverpool to study that disease.

If the pathogenic organism of yellow fever, hitherto undiscovered, prove to be a vegetable organism, the fact will suggest that transference by suctorial insects and arachnids, with which we are already so familiar in the case of animal parasites, may be no less common in the case of vegetable parasites. *A priori* there is nothing improbable in the view that suctorial insects may become generally infected by blood containing schizomycetes, which may next find their way by route of the insects' salivary glands or otherwise into a fresh host. There are certainly some epidemiological facts which suggest the possibility of infection by gnats in undulant fever and perhaps leprosy, and by other vermin, in relapsing fever, typhus, and perhaps several skin diseases.

Ankylostoma Duodenale.

Another important advance is contained in the confirmation of Giles's life-history of the ankylostoma duodenale by Annett—details of which will shortly be published. These observations throw a vivid light on the route of infection adopted by these dangerous and widespread parasites.

Undulant Fever.

Owing to observations made by Wright on the serum reaction in undulant (Malta) fever, this disease has been shown to exist in India, Hong Kong, the United States, the West Indies, and Brazil—a most important fact in connection with the great subject of tropical fevers.

Malaria.

The recent advance in our knowledge of malaria has been well maintained by numerous observers.

The practical side of the mosquito theory, which at once became predominant after the determination of the life-history of the parasites, has been energetically treated by Koch and his assistants, who have successfully dealt with malaria on a large scale by means of quinine. Similar work has been performed with success in the United States, and, according to reports, in Italy. In British possessions isolated efforts to deal with malaria according to the new principles have been made by Sir William MacGregor and Strachan at Lagos, and by Thomson and Young at Hong Kong; but the country generally has not adopted an intelligent attitude in this connection.

On the other hand, British workers have closely studied details of the malaria question in many parts of the world. We must refer especially to the good work done in Central and West Africa by the Malaria Commission of the Royal Society, and to an admirable sanitary survey of Nigeria made by the Liverpool expedition during the last year. Direct cultivations of the parasites have been reported by Daniels, Ziemann, van der Scheer and van Berkelom, and Woldert in various countries—all in *Anopheles*; while Manson has completed an interesting crucial experiment for the popular demonstration of the theory by infecting healthy persons (T. Manson and Warren) in London by mosquitoes brought from Italy, and by simultaneously preserving others (Sambon and Low) in health in the Campagna in a mosquito-proof house. Nuttall and Shipley, Christophers and Dutton have closely examined the anatomy of gnats. Nuttall, Cobbett, and Strangeways-Pigg have made interesting researches on *Anopheles* in England, in which, by the way, cultivation experiments have hitherto failed. Gosio, Giles, Reinhold Ruge, Fearnside, Neveu-Lemaire, and others, have done useful work on the subject in many directions. It remains, however, a matter for regret that stronger efforts have not been made to determine the reason why individual gnats of an amenable species so often resist infection. Until this difficulty is cleared away negative experiments with *Culex* cannot be entirely convincing.

Since the last annual meeting of the Association the mosquito theory of malaria has received the highest scientific acceptance in the address of the President of the Royal Society, Lord Lister.

Filariasis.

In regard to filariasis the discovery of Low and James has been confirmed and amplified by several observers. Manson has suggested the possibility of reducing lymphatic varix by leading a lymphatic duct below the stricture into a neighbouring vein.

Plague.

The prompt suppression of plague in Glasgow has further demonstrated the value of energetic sanitary measures in this disease; and the large demand for plague vaccine gives encouraging evidence in favour of Haffkine's prophylaxis.

Beri-beri.

The close clinical similarity of beri-beri and chronic arsenical poisoning seems to suggest that

many cases attributed to the former disease may possibly be in reality due to arsenic.

Work for the Future.

It seems to me that further researches are at the present moment most urgently required in connection (1) with tropical fevers; (2) with the flora and fauna of the intestine in tropical bowel complaints; and (3) with the question whether European children in the tropics suffer as frequently from malaria as do the children of natives. The practical necessity of taking measures against the uncontrolled propagation of gnats in tropical cities is one which, in view of recent discoveries, can no longer be set aside by sanitary authorities without dereliction of duty.

The profession owes its sincere thanks to all those gentlemen who have done so much during the past year—often without remuneration and at considerable personal risk—for the cause of tropical medical science. It also owes its thanks to those British merchants who have generously subscribed large sums of money for the prosecution of many of the researches to which I have referred.

British Medical Association.

(Continued.)

ABSTRACT OF PROCEEDINGS.

Thursday, August 1, 1901.

CAUSATION OF ENTERIC FEVER IN INDIA.

Dr. ANDREW DUNCAN (London), Lt.-Colonel, I.M.S., (retired), contributed a paper on the "Ætiology of Enteric Fever in India." He first drew attention to some of the theories that have been upheld concerning enteric in India.

(1) The vicarious theory of Martin. According to Martin, hepatic activity in India is followed by insufficiency of action, and a vicarious and abnormal activity of the intestinal glands supplemental to the hepatic insufficiency. This condition terminated in suppurative enteritis, followed by an idiosyncrasic predisposition of the glands to this abnormal state.

(2) The transformation theory of M. Colin. Primary paludal infection may be transformed into enteric fever, or enteric fever may be spontaneously developed from all acute febrile states.

(3) The theory of Surgeon-General Moore, who regarded no fever as specific; typhoid fever is merely to be regarded as a phase of fever, not a specific disease, the enteric spots being merely a petechial eruption.

(4) The theory of Sir Joseph Fayrer that faecal poisoning cannot be attributed as the cause of enteric in every instance, but that climatic and telluric conditions play a large part in the ætiology of the disease in India.

(5) Surgeon-General Gordon, of Madras, at one time advanced the theory that enteric fever did not exist in India.

(6) Sir Anthony Home held that in all fatal cases of fever in which at the *post mortem* any ulcerations of the intestines were found were to be regarded as enteric.

Dr. Duncan stated that the factors concerned in the evolution of enteric in India are: (1) the yearly advent of a large number of soldiers and others at an age most likely to contract the disease; (2) the country presents an environment most favourable for the propagation and spread of the disease.

As regards the spread of the disease, there seems every reason to believe that the soil of many parts of India is contaminated largely with the bacillus of Eberth, and that the soldier imbibes the organisms whilst away from barracks by drinking "native" concoctions in the bazaars. Everywhere also in India are dust storms met with and flies abound, both contributing to infect those who have not acquired an immunity to the disease.

As regards prevention, one method of dealing with the trouble is to burn the stools of the enteric patients. The urine also must be dealt with, for it has been shown to contain the bacillus for even a longer time than do the motions.

Dr. Duncan advocated inoculation as introduced by Professor Wright, of Netley, and he claimed that the published results of this treatment deserve to be acknowledged as a success. The record in India in 1899 showed that the percentage of strength to cases of typhoid was: amongst the inoculated .98 cures, with .2 mortality in 4,502 cases. Amongst the non-inoculated, 2.54 cures, with .5 mortality in 25,851 cases.

According to Dr. Duncan, a number of hospital returns in South Africa show a favourable result due to inoculation. In Egypt and Cyprus, and in the great epidemic at Maidstone, the evidence of the prophylactic power of Wright's anti-typhoid fluid was very apparent.

Dr. A. CROMBIE, Lt.-Col., I.M.S. (retired), did not believe that typhoid was so commonly met with in India amongst natives as amongst Europeans. In some parts and amongst certain peoples the disease was prevalent, whilst in other parts it was almost unknown. Thus, among the Ghoorkas typhoid was very common, whereas in Madras and Lower Bengal enteric ulcerations were seldom found *post mortem*. Dr. Crombie mentioned an observation pertinent to the value of Widal's reaction. He examined the blood of three natives of Bengal under the age of 30, living in London, and of three, of similar race and similarly placed, over the age of 40. The blood of the first group of cases gave well marked Widal reaction, although the men appeared in good health, nor had they ever been laid up with typhoid, nor were they ill at the time of examination. Of the cases over 40 years of age that were examined, no reaction fell with Widal's test. Dr. Crombie believes that there are fevers which run a twenty-one days' course in India, in which there is no eruption, no diarrhoea, and but occasionally an enlarged spleen, which are not typhoid at all. In South Africa 75 per cent. of the cases returned as typhoid gave Widal's reaction. Concerning the value of Wright's antityphoid inoculations, he had noted that of 300 cases convalescent from typhoid in South Africa 60 per cent. of the 300 had been inoculated once, and 10 per cent. inoculated twice. He knew of one case inoculated a second time with six months' interval between inoculations to

have had typhoid two months after the second inoculation; second attacks of typhoid were not uncommon.

Capt. BATTYE, I.M.S., stated that, with the idea of testing the method of spread of typhoid, an experiment had been made in India in which servants were made to rinse their hands in water in a common basin; but although they continued to do so for many days the bacillus of Eberth was not found in the water in the basin. Capt. Battye believed that a harmless organism may become pathogenic under certain conditions, such as the presence of decomposing matter would engender.

Lt.-Colonel POYNTER, I.M.S., said that enteric in India was probably a disease of youth, and that it was possible the men mentioned by Dr. Crombie, as being over forty and giving no Widal reaction, in all probability had had the disease in their youth.

Professor SANDWITH (Cairo) held that the anti-typhoid inoculation method of Wright was not yet complete in any way. We scarcely even know what we are injecting, and the after effects are very uncertain. Professor Sandwith mentioned that of twelve nurses who went to South Africa three got typhoid although none of them died. He advocated systematic blood examination when Wright's treatment was being tried.

Friday, August 2, 1901.

Dr. MAX. F. SIMON, C.M.G., in the Chair.

MALADIES OF EUROPEAN CHILDREN IN HOT CLIMATES.

Dr. A. CROMBIE (London), Lt.-Colonel, I.M.S. (retired). This paper consisted of a careful enquiry into the comparative rates of illness of British children at home and in India, and of the mortality therefrom. Dr. Crombie's experiences were gained in Calcutta during a long residence, and the patients were the children of (military and civil) parents resident there. Speaking generally of the children of the civil population, it may be said that the sick rate of European children is lower in India than it is in the United Kingdom. When, however, the death-rate is considered, there is a material difference, the death-rate of soldiers' children in Britain being but 18.31 compared with 41.09 per thousand in India. Illnesses in India are therefore much more fatal.

	Admission rate				Death rate				Case Mortality per cent.	
	Britain	India	Britain	India	Britain	India	Britain	India	Britain	India
Eruptive Fevers	94.9	68.9	26.0	..	1.27	1.82	..	0.55	1.3	2.7
Malarial Fevers	1.7	97.3	..	95.6	0.0	2.18	..	2.18	..	2.2
Other Fevers	4.2	18.0	..	14.8	0.0	0.55	..	0.55	..	3.0
Tubercular Disease	2.3	3.1	..	0.8	0.08	0.73	25	..	43.2	23.5
Debility, etc.	18.0	38.4	..	20.4	0.08	2.36	..	1.88	5.4	6.1
Other General Diseases	27.8	17.8	10.5	..	1.73	8.45	..	1.72	6.3	19.3
Diseases of Nervous System	9.3	10.0	..	0.7	2.80	5.82	..	3.02	30.4	58.2
Respiratory	134.9	68.0	69.9	..	4.46	6.91	..	2.45	3.3	10.2
Digestive	103.5	96.2	7.3	..	3.71	13.09	..	9.38	3.5	13.4
All Diseases	507.8	527.1	..	19.8	18.31	41.09	..	22.78	3.6	7.8

This table is a very instructive one, and shows that when the cases of malaria are described as not being common to both Britain and India, the admission rate in India is reduced to almost 100 per 1,000 less than it is in the United Kingdom. Even including malaria the table shows that the admission rate for soldiers' children in India is only 19·8 per 1,000 in excess of the admission rate in Britain. The table also shows that apart from malaria the *eruptive fever* and diseases of the respiratory apparatus claim the greatest number of victims. Measles prevails and during 1899 measles occurred almost as frequently amongst European children in India as at home, being 60 against 63 per 1,000; but measles proved more fatal in India than in Britain, the actual numbers being 2·4 per cent. against 0·9 per cent. Scarlet fever is a rare occurrence in India, but occasionally outbreaks of the disease occur.

Of the *respiratory disorders* it may be said that the children in India have the advantage as regards the chances of attack, but the mortality amongst them is much higher than amongst children similarly afflicted in Britain. Pneumonia is, according to Dr. Crombie, a very prevalent ailment in India amongst all races, but its presence is frequently returned as fever; he considers pneumonia next to cholera, the most formidable disease met with in practice in India.

As regards the *digestive system* it comes somewhat as a surprise to find that, the generally expressed opinion that whereas the brunt of disease is borne by the chest in cold climates, it falls on the digestive organs in the tropics, is not true, comparatively speaking. Dr. Crombie brought forward statistics showing that the admission rate amongst European soldiers' children in India was less than what occurred at home; but the gravity of the illnesses, however, reverses the picture, for they are almost six times more fatal in India than in Britain.

Dysentery is a disease difficult to define and it is apt to be confounded with rectal catarrh or proctitis, &c. Tormina, tenesmus and bloody mucus in the stools, are not diagnostic of dysentery, but of several intestinal ailments. The general term dysentery, however, has come to be applied to many lesions associated with intestinal flux; hence the cures by various specifics so often heard of. Now it is the ipecacuanha treatment that is in favour, or the saline treatment is fashionable; whereas for the usually transient ailment entitled dysentery, but more often, in fact in 90 per cent. perhaps of the cases, it is mere rectal catarrh, warmth to the abdomen, rest in bed, and purgatives, followed by Dover's powder, would equally well effect a cure.

It is notable that children in India do not have liver abscesses however prevalent dysentery may be amongst them. The fact is that few children have real dysentery, but should they have it, the dysentery is evidently not of that type which is followed by liver abscess.

The term "Other General Diseases," mentioned in the table above, includes whooping cough, mumps, anæmia, and immaturity at birth. Rickets is very uncommon amongst natives of India, this may be accounted for in some measure by the fact that native women nurse their children more frequently than the mothers of Western Europe.

Simple continued fever is a form of illness in India which claims many victims. It is a name given to a continued fever of a good many days' duration, which may extend to twenty-one days, but which does not present the usual clinical features of enteric fever and on this account the graver name of enteric has been withheld. In South Africa 75 per cent. of cases returned as simple continued fever gave Widal reaction so that it was necessary either to review the diagnosis or enquire into the value of Widal's test. It is a fact that a very large percentage of natives of India, who are not suffering from any febrile condition, and who have never, or certainly, not for many years, suffered from any fever which could be, by any possibility, diagnosed as enteric fever, give the reaction in a perfectly characteristic way.

TUBERCULAR DISEASES.

Amongst natives of India it seems to be generally conceded that tubercular ailments amongst children are uncommon. Chevers, for instance, states that he never saw a case of enlargement of the glands of the neck from tubercle amongst native children in the plains of India.

Tabes mesenterica is very rarely seen amongst natives, but European children formerly suffered from the complaint to a considerable extent in India. In recent years, however, the returns under this heading have become much fewer.

The lessons conveyed by Dr. Crombie show that while European children in India enjoy a certain relative degree of immunity from some of the diseases prevalent in childhood, especially as regards respiratory diseases and the eruptive fevers, "other general diseases," and to a slight extent diseases of the digestive system, their death rate and the case mortality from all diseases, with the solitary exception of tubercle, is higher than those prevailing in the United Kingdom amongst the same class.

Dr. EDWARD HENDERSON (London), in discussing Dr. Crombie's paper, said: "My personal experience regarding the health of European children in hot climates has been gained in the sub-tropical climate of Shanghai during the thirty odd years I have been engaged in active general practice there. I have always in Shanghai had a large number of children under my care, and have had ample opportunity of watching their growth and development under the different conditions of continued residence in China, or in the majority, a life interrupted by more or less frequent and lengthened intervals spent in Europe.

Of course the man who practises in a sub-tropical climate wants something of the experience of the man who does his work entirely in the tropics; but, on the other hand, he has the advantage of being able every year to contrast the health which his patients enjoy in cool or even cold weather with their condition when subjected to tropical heat. In Shanghai these climatic changes are always well marked, and our summers there are seasons of tropical heat lasting for nearly four months.

The effect of tropical heat on the European constitution is as a rule unfavourable; and children appear to suffer more in this way than adults. Anæmia and loss of tone are always more or less apparent in

European children after a summer spent in Shanghai. Disease, too, during hot weather alters in character somewhat, affecting at that time the digestive organs, chiefly in the form of diarrhœa, dysentery and infantile cholera.

While it is evident that heat is the principal cause of this deterioration and these diseases, it is often difficult to say in what way exactly it has acted in individual cases. Heat causes general enfeeblement of the nervous and muscular systems, and through these affects the digestive organs, depriving the child of appetite, and making the assimilation of what food he is able to take, a more or less difficult process. Heat probably favours the development of the specific germs on which such diseases as epidemic diarrhœa and dysentery depend. In addition, heat causes the rapid decomposition of all food stuffs; making much which is, under ordinary circumstances, perfectly wholesome, injurious or even positively dangerous; and milk, which is or ought to be the staple food of children, is peculiarly apt to suffer in this way.

Of the more remote effect of tropical heat when long continued, I may mention the too rapid growth of children at the expense of general development. I have been quite often told by parents who have taken children home to England, that after their arrival there they stopped growing for a time, though gaining in weight and strength. The cycle of Nature, both animal and vegetable, is shorter in the tropics—the girl becomes a woman at an earlier age. Maturity is sooner reached, and decline hastened. The practical outcome of all this is that the European ought not to be allowed to spend more of his young life in the tropics than can be helped. At the age of from 4 to 7 he should be sent to Europe and kept there until growth is fairly well completed.

Time presses and in what I have still to say I will confine myself to a few general considerations regarding the disorders which affect the alimentary canal; the most common form of illness which the doctor who has children under his care in a hot climate is called on to treat.

In the treatment of diarrhœa success will, I believe, usually be found to lie in the general management of the case; drugs playing a comparatively subordinate part. In the first few hours of alimentary canal disturbance which threatens to develop into a case of infantile cholera, the principal point is to stop the giving of food altogether, especially cow's milk. In such cases beef juice, or egg albumen diffused in water, comes in well later; and brandy is often of great service. The thirst from which the little patient suffers needs constant attention, and water must be given freely whether rejected afterwards or not. I mention these points to illustrate what I mean by general management; of drugs in this disease I know of nothing better than calomel, in small doses, frequently repeated. Whatever be the cause of infantile cholera—whether a specific germ or only the decomposition of naturally wholesome food—there can be no doubt that bottle-fed infants are much more apt to suffer from it than those who get their natural nourishment from the breast.

Milk is a food which so easily decomposes in hot weather that in the tropics its condition needs con-

stant attention; and the feeding of infants, which must be done at night as well as during the day, becomes a very difficult matter indeed for the nurse. Add to this that we have not always in the East an active and intelligent staff of officials to look after public dairies; and the native dairyman is emphatically not a man to be trusted.

If, as often happens in hot climates, the European mother is unable to nurse her infant, a good wet nurse should be always provided; and she can usually be easily got among the natives, if ordinary care be taken in her selection. I speak of course from my own experience in China.

In France a special form of diarrhœa used to be described under the name of "diarrhœe sudorale," in which the mucous membrane lining the alimentary canal sympathised with the excessively acting skin. And excessive perspiration in children should always receive attention. It is difficult to keep children who are able to run about, under a punkah; but in hot weather a punkah in the nursery, pulled during the hottest hours of the day, at the time of the siesta, which children should always be encouraged to take, is of great service in maintaining health. In very hot weather the child should sleep on soft matting, such as we know in China under the name of Canton matting; and a night punkah is often valuable; of course a child who sleeps under a punkah at night should be sufficiently clothed, and always have the abdomen covered.

Among the outside causes which sometimes excite or may aggravate bowel disorders, the possible presence of intestinal worms should in the East always receive attention. From what I have myself seen I believe that lumbricoides are much more common abroad than in England. The presence of these worms may be unsuspected, as apparently they may exist for quite a long time, and even in considerable numbers, without causing any evident departure from health. I have myself seen on more than one occasion the vomiting of one of these worms as the first recognised sign of their presence. Sea sickness in children returning from the East is often attended with an occurrence of the kind. I have said that in treating diarrhœa the general management of the case is usually of most importance, but I quite admit that when medicine is given our modern pharmacopœias have much to offer of value in the bowel antiseptics which arrest fermentation, and the astringents which pass through the stomach unchanged to act on the intestine.

Dr. MANSON, C.M.G., F.R.S., asked Dr. Crombie for a definition of dysentery, and what he means by true dysenteries in children. He also requested information upon the presence of diphtheria, trismus neonatorum, and hypertrophic cirrhosis of the liver in India. Dr. Manson also asked for some information as to whether European children showed proclivities similar to Mahomedan children. He agreed with Dr. Henderson's remarks concerning the advantages to the health of European children accruing from being breast-fed, in preference to being bottle fed, and said that when the mother could not suckle the infant it was wise to obtain a native wet nurse.

Major W. H. BURKE, I.M.S., stated that he should

like to endorse the opinions expressed by Colonel Crombie regarding the rarity of enteric fever amongst natives of India. He had treated many cases of enteric amongst Parsees, and also amongst what may be called the scions of noble houses, sons and relatives of native chiefs; the Parsee has no caste prejudices and the Rajah is above them! This seems to me to bear out the deductions Colonel Crombie drew.

On the other hand, Colonel Crombie stated that tuberculosis was not common amongst natives in India; whereas, at present there is an immense amount of tuberculosis amongst natives in Bombay. He was of opinion that Colonel Crombie had not dwelt sufficiently on the unhealthiness for European children, of the rainy season in India, nor on the functional weakness of the livers of European children in India.

Mr. CANTLIE (London) stated that trismus neonatorum was very prevalent amongst the Chinese infants in Hong Kong, and that the deaths from trismus formed 50 per cent. of the total mortality of the population. He had seen a death from trismus in a European infant; the monthly nurse in this case was also a European, but she came straight from a convent where trismus amongst infants is always rife and no doubt conveyed the infection. Tuberculosis was prevalent enough amongst Chinese, but the half-castes suffered more than any other section of the community. In fact, the proportion of half-caste women that lived to 30 years of age was very small indeed.

Dr. CROMBIE, in reply, said he could not define dysentery but considered ulceration of the solitary glands an essential feature of the disease. Diphtheria and trismus were common in Calcutta, but hypertrophic cirrhosis of liver is unknown amongst European children in India; it is frequent amongst Hindoos but Mahomedans are exempt.

SOME OPHTHALMIC COMPLICATIONS OF PLAGUE.

Major F. P. MAYNARD, I.M.S., F.R.C.S., Civil Surgeon of Patna, communicated a paper on this subject. During the epidemic in Patna he met with twelve cases of plague in which eye disease complicated the illness. Of the twelve patients examined, six recovered with one eye sound, for the remaining eighteen eyes the lesions were: (1) cornea hazy in four, opaque in two, and sloughing in four; (2) iritis varying from a few spots of pigment on the anterior capsule to occlusion pupillæ, in twelve cases, and in three others the iris was prolapsed; (3) scleral staphyloma occurred twice, in both it was ciliary and in each the dark projection was separated from the corneal margin by a strip of healthy looking sclera; (4) the lens was hazy in seven eyes and quite opaque in five; (5) the media were hazy in six; (6) the fundus was normal in three, showed hæmorrhage in one, and the appearance of a limited retinitis pigmentosa in one other; (7) the tension was diminished in twelve cases, normal in the rest; (8) vision *nil* in five, perception to light only in eight, and fairly good in five.

The most remarkable feature in the *post-mortem* examination was, that whereas in plague extensive hæmorrhage occurs in different parts of the body, in

only one eye was some slight extravasation seen. Except in one case, perhaps, treatment was of no avail. For this case Major Maynard administered iodide of potassium and nux vomica internally, dropped atropine into the eye and applied blisters on the temples.

SOME REMARKS ON ASYLUM PRACTICE IN SINGAPORE.

Dr. W. GILMORE ELLIS, M.D., M.R.C.S., Medical Superintendent Singapore Lunatic Asylum, commenced his paper by describing some of the difficulties which he met on his first arrival at his post. These difficulties consisted for the most part in defects in the asylum, both general and also particular in relation to a large proportion of the inmates; the use of mechanical restraint; the lack of good and reliable records; and last, but not least, the difficulties in connection with the many languages and dialects spoken by the patients. He described also the great difficulty which must always exist in obtaining anything like correct histories of the majority of patients, who are for the most part caught by the police and sent to the asylum as "wandering" lunatics.

As in India, so in the Straits, the majority of patients belong to the lowest classes, with minds not calculated to grasp anything outside the commonest relations of life, and they are often admitted in the poorest physical condition. There is a marked absence of the more acute forms of insanity, the most prevalent form being an exaggeration of a low standard of intelligence passing rapidly into dementia; primary dementia is not uncommon; delusions and hallucinations are as a rule of very simple character; a belief in witchcraft is universal, and *normal*; it is often given after recovery as a cause of insanity, and must not be considered in itself as at all a *sign* of insanity. Melancholia is rare and never very acute. General paralysis of the insane is rarely if ever seen among Asiatics. Dr. Ellis had never seen a case; the general causes of this disease, anxiety, worries, excesses, are uncommon among Asiatics.

The female recovery rate is about 35 per cent., the male about 41 per cent.; only one case of puerperal insanity was met with in twelve years. There are many admissions from syphilitic insanity, and from insanity following malarial fever, which latter end in recovery. Neither opium smoking nor the subcutaneous use of morphia are regarded as causes of insanity.

The food question in an Eastern asylum is important, and refusal of food must not be looked upon as a sign of insanity without careful investigations, as, so long as a mere glimmering of sense be left, it may be a question of "caste" or religious prejudice. There is great difficulty in finding amusements for Asiatic patients.

Beri-beri is a frequent cause of mortality in the asylum.

Dr. Ellis dealt also with the subject of Amok, which he states is practically peculiar to the Malay race, and is a state of blind, spurious, homicidal mania. As exciting causes of the condition, fright,

grief, a severe illness, brooding over real or imaginary wrongs, the sight of blood, malarial fever, and a peculiar condition of nervous depression, have all been cited. The question of legal responsibility for the actions of the person seized by Amok is a perplexing one; but Dr. Ellis is inclined to believe that there are two varieties, one which is purely pathological, whilst in another form Amok is feigned more or less for the purpose of obtaining revenge.

Dr. MOFFAT (Uganda) remarked that it is a curious fact that in regard to nervous diseases among the natives in East Africa such affections as locomotor ataxy and general paralysis of the insane are extremely rare, although syphilis, which is generally supposed to bear an aetiological relation to them, is common enough. Sexual excesses and intemperance are both rife, and yet, in spite of all this, nervous diseases generally are rare among the natives of East Africa. The Soudanese, Nubians and other tribes are especially addicted to running Amok. In their own words they ascribe it to "seeing the devil," and they always profess absolute ignorance of their actions after the fit has passed over.

Dr. HENDERSON said that in Shanghai the Chinese suffered from acute mania and from suicidal impulse.

AN EPIDEMIC OF ZINC POISONING THROUGH DRINKING CONTAMINATED WATER IN THE TROPICS.

JOHN D. GIMLETTE, L.R.C.P., M.R.C.S., Residency Surgeon, Pahang, Federated Malay States, communicated a paper on this subject, in which he stated that this epidemic occurred during 1900, among a half-company of men of the Malay States guides (Sikhs and Pathans) stationed at Kuala Lipis, Pahang.

The men lived in barracks, built in 1898, and roofed with galvanised iron. In January, 1900, galvanised iron tanks were supplied, in order that water might be collected from the roofs of the buildings; the water supply had been obtained previously from a large river in the neighbourhood.

In 1900 an unusually large number of men were attacked with gastro-intestinal troubles; from March to October, 1898, thirty men were treated for this class of disease; from March to October, 1899, there were fifty-eight such patients; but from March to October, 1900, the number rose to 219, and at the close of the year it was found that forty-three individuals out of the fifty-six men of the half company had suffered.

In October, Dr. Gimlette began to suspect some form of metallic poisoning, and after applying some rough tests which proved the presence of zinc in the water, he sent samples of it to the government analyst in Singapore, who reported acid carbonate of zinc in solution in large quantities, from 4.82 to 11.45 parts per million. White patches of adherent powder were common on the roofs; one of these from a gutter was examined and found to consist largely of zinc and carbon dioxide.

Discontinuance of the water was ordered, and the number of gastro-intestinal patients steadily decreased, only twenty-two cases (many of these being old patients) having been treated from January until April, 1901.

The symptoms presented were those of colic, diar-

rhœa with consequent anæmia and emaciations, and a spurious kind of dysentery. A clinical account of six typical cases, with one death from exhaustion from long-continued diarrhœa, is given in the paper.

In concluding, Dr. Gimlette asks the pertinent question as to whether it is not advisable that enquiry be made as to possible contamination of water in places in Australia and South Africa where water is collected from galvanised iron roofs, especially in regard to the prevalence of gastro-intestinal disease in the latter country.

Mr. CANTLIE drew attention to the suggested resemblance between beri-beri and many of the cases of arsenical poisoning from drinking adulterated beer in Manchester and elsewhere in England. The subject was mentioned in Major Ronald Ross's presidential address to the Section of Tropical Diseases, and it was being discussed at one or more of the several sectional meetings of the British Medical Association now being held. He thought that it would be expedient that an expression of opinion on the subject should be got from those present who had seen beri-beri in China, the Straits Settlements or elsewhere.

Dr. MAX. F. SIMON, C.M.G. (Singapore) remarked that he did not think beri-beri could be traced to arsenic or any other metallic poisoning. There was nothing in common between the two complaints except neuritis. In beri-beri there were neither skin, eye nor digestive symptoms present to justify such a conclusion.

Dr. MANSON, C.M.G., F.R.S., expressed a similar opinion, but pointed out the great difficulty he had in diagnosing between beri-beri and alcoholic neuritis, when the patient suffering from the latter disease came from a country where beri-beri prevailed. Some definite clinical sign or symptom of beri-beri should be carefully and persistently sought for in order that a clear and precise diagnosis of the disease may be arrived at.

Dr. EDWARD HENDERSON, M.D., F.R.C.S.E., said he fully endorsed what Dr. Manson said about the difficulty which may arise in distinguishing a case of alcoholic neuritis from one of beri-beri, but cannot understand how such confusion can ever occur when the distinction has to be made between beri-beri and chronic arsenical poisoning. He had seen a large number of cases of beri-beri in China, but cannot remember ever having seen skin pigmentation as a symptom in any of them. He regards the theory of metallic poisoning as untenable.

FILARIAL ABSCESS.

Dr. J. PRESTON MAXWELL, F.R.C.S. (China), contributed a paper on filarial abscess. In his practice in Southern China, he was at first struck with the frequent occurrence of abscess in connection with the scrotum, as compared with its occurrence in England.

In searching for a cause he was able to exclude tubercle, venereal and urinary affections, injury, and bites of insects, and on commencing to systematically examine the blood he found *Filaria sanguinis hominis nocturna* in all cases. Subsequently he found this filaria in cases of abscess in some other localities, such abscess being apparently the early manifestation of filarial disease. Such abscesses occur most frequently

in the scrotum, but may occur also in any situation where there is loose connective tissue rich in lymphatics; for this reason the majority, apart from those in the scrotum, are found in the vicinity of the large vessels, *e.g.*, in the axilla, or in Scarpa's triangle or Hunter's canal.

In one case only portions of the body of a parent worm were found in the abscess; the death of the parent worm may be sometimes the cause of the abscess, but Dr. Maxwell is inclined to think that in many cases the cause may be connected in some way with the blocking of lymphatic vessels, especially as in several cases the abscess appears to be the first manifestation of elephantoid disease of scrotum or limb.

Filarial abscess may be thus classified:—

- (a) Abscess of scrotum :
 - (1) Suppurating hydrocele; (2) abscess of the cord ;
 - (3) abscess below the testicle.
- (b) Abscess of the limbs.
- (c) Intra-abdominal or intra-thoracic abscess.

Clinical and diagnostic points in connection with these varieties of abscess are described in the paper, as also is the treatment, which consists in incision and drainage, the latter requiring sometimes, especially in cases of abscess of the cord and femoral abscess, careful attention.

Filarial abscess, if treated, ends in recovery so far as the condition itself is concerned, but it is liable to be followed by elephantoid trouble, of which, as has been said, it seems sometimes to be the first manifestation.

Three typical temperature charts accompanied the paper, and a list of twenty-three cases of the disease.

Dr. MANSON said that abscesses occurred around dead parent filarial worms or they may be produced within an area of obstructed lymphatic tissue. Grave conditions result from abscess forming around dead filarial worms within the thorax or abdomen. He had seen a case in which the filarial embryo gradually disappeared from the blood, after a series of febrile attacks evidently the result of deep-seated inflammation in the abdomen. The febrile attacks were probably due to the disturbance caused by the death of a parent filaria among the abdominal lymphatics in front of the spine; and the lessening in numbers of parent worms brought about a corresponding decrease of numbers of their embryo in the blood. Dr. Manson believes that it would be possible to short circuit the passage of the lymph on its way to the veins. In a well-marked case of obstruction in, say, the thoracic duct, the lymph finding its way blocked causes a varicosity in the lymphatics below, enlargement of groin glands, and, passing to the superficial lymphatics, gets by collateral circulation onwards to the upper part of the body. Dr. Manson suggests that the blocked lymphatic channels could be made to open into the surface veins of the thigh by suturing the one vessel to the other, and thereby relieve the lymphatic circulation and allay the tendency to elephantiasis, &c.

Professor McWILLIAM (Aberdeen) saw no physiological objection to the lymph from a lymphatic in the groin being made to discharge its contents into a vein.

SOME POINTS CONNECTED WITH HUMAN FILARIASIS.

Dr. J. EVERETT DUTTON, Liverpool School of Tropical Medicine, contributed a paper which dealt specially with the question of how the filariæ escape from the strong chitinous case of the labium of the mosquito into the blood of man.

Grassi and Noe believe that owing to the bending of the labium stuffed with filariæ, when the mosquito pierces the skin with its stylets, a rupture of the integuments at the bend takes place and allows the filariæ to escape from the chitinous labium.

Dr. Dutton, however, believes he has found near the tip of the labium a roughly triangular region, bounded above by the stout band of chitin forming the upper surface of the labium, and in which the stylets rest, and on either side by the two lateral regions of the labium. This area is occupied by a very delicate loose membrane, covered with very fine hairs; it is easily torn, and is rather difficult to see under the microscope owing to its transparency. This region appears to be the weak spot in the chitinous exoskeleton of the labium, and in all probability it

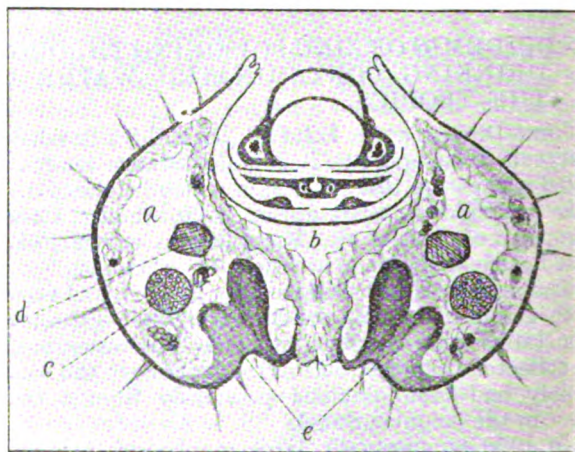


DIAGRAM SHOWING TRANSVERSE SECTION OF PROBOSCIS OF ANOPHELES COSTALIS AT LABELLAR JOINTS.

- (a) Lateral pear-shaped end of main body of labium.
- (b) Triangular region. Above (b), chitinous surface of tip of labium; below, loose membrane.
- (c) Nerve to labella.
- (d) Tendon to labella.
- (e) Regions of labellar joints.

is through this weak spot that the filariæ escape whilst the mosquito bites. Manson has suggested that the young filariæ can apparently discriminate between flesh and vegetables; he states that mosquitoes affected with filariæ did not get rid of the parasites after many meals of bananas, but the worms could be seen coiled up in the proboscis. Grassi and Noe, however, state that a great quantity of anopheles, certainly infected within the labium on August 8th and submitted to a fruit diet, presented the labium on August 10th completely empty. It would therefore appear that the filariæ may occasionally pass from the proboscis into vegetable substance. As, however, it is very probable that the female mosquito lives on blood alone, there can be no great risk of the young filariæ being lost in a fruit diet.

Original Article.

A CASE OF GENERAL EXFOLIATIVE DERMATITIS.

By Staff-Surgeon P. W. BASSETT-SMITH, R.N., Haslar.
Courteously forwarded by the Director-General, Medical Department, Admiralty.

CASES of general exfoliative dermatitis, or pityriasis rubra, are of sufficiently rare occurrence to be placed on record, and though it can scarcely be called a tropical disease yet the onset of the present case, taking place while the man was serving in the Mediterranean, renders it the more suitable for this Journal.

In the very full account of this curious and often fatal skin affection, as described by Stephen Mackenzie in Allbutt's "System of Medicine," the most important characters are pointed out, with the great variations that are found; the present case falls in best with those originally described by Hebra as "pityriasis rubra," the great and general desquamation, the intense redness of the true skin, the albuminuria and the fatal termination. The term pityriasis is, however, not strictly appropriate, as the epidermis mostly came off in great scales or flakes, sometimes as large as the hand, they were often very thick, not at all "bran-like." It is also difficult to say whether the disease was primary or secondary, though at first described as appearing in small scattered psoriasis-like patches on the trunk and extremities; these rapidly spread until the whole surface was implicated, that is taking six months to do so, death occurring after one year and ten months.

The most noticeable points were: (1) The ravenous appetite throughout; (2) the early and extensive arthritic complications with fever, leading to hyperflexion of most of the joints; (3) the large bed-sores; (4) the presence of albuminuria which disappeared shortly before death, when the urinary secretion became greatly diminished, accompanied by a semi-comatose, probably uræmic, condition, in the last week.

There was no marked history of syphilis, or alcoholism, the latter, according to Pringle, being frequently found.

The *post-mortem* appearance is well shown in the photograph, it was found to be impossible to straighten the limbs even after division of the tendons; this was in great part due to the contraction of the skin and soft parts, but also to partial anyklosis of the joints themselves.

The true skin was found to be thickened and intensely congested.

Microscopical examination of kidneys, showed much degeneration of the tubular epithelium, like that found in chronic parenchymatous nephritis, with marked distension of the vessels with blood and with small hæmorrhages scattered about, especially in the cortical substance.

For the careful notes here epitomised, I have to thank Surgeon W. L. Martin, R.N., and also Deputy Inspt. General Mahon, C.B., R.N., for permission to use them.

Mr. C., aged 22, Pt. R.M.L.I.

History.—While serving in the Mediterranean, about June, 1899, he had small and scattered patches

of psoriasis on the trunk and extremities; in January, 1900, the greater part of the body surface, scalp, face and limbs, were covered with extensive patches of psoriasis, the eruption then was noted as being remarkably scaly. Both shoulder joints and the right knee became tender and swollen; treated with salicylates and arsenic, also liq. carbonis detergens locally. In September, 1900, he was sent to Malta Hospital, being then very emaciated and debilitated, the whole body was covered with the eruption, the right knee joint was full of fluid, and there were general arthritic pains, and evening pyrexia. While there he is said to have improved and was invalided home, arriving at Haslar on December 1.

Condition on admission.—Very emaciated, unable to walk or even raise himself in bed without help, the whole skin surface covered by a scaly eruption; the flakes that came off were generally large and thin, the skin beneath being intensely red and shining; enormous numbers of flakes peeling off daily, filling a quart measure; the scalp and face were equally affected, some of the nails of fingers and toes had dropped off, others were thickened and variously distorted. Three bed sores were present, one over the sacrum, one over upper and one over lower dorsal regions. The right and left knee joints were in a state of hyperflexion, and were partially ankylosed. Right elbow in much the same condition. The lower limbs were slightly œdematous. The patient stated that he felt quite well; though intensely weak, his appetite was large and he was able to smoke; the urine was acid, clear, but contained a large amount of albumen.

On January 1 the urine had decreased in quantity; there was more œdema, desquamation profuse. Thyroid extract and hot baths were now tried.

On the 10th, owing to diarrhœa and no evidence of improvement these were left off.

On 27th, there was marked bronchitis, and involuntary action of the bowels. More œdema.

February 4.—Urine reduced to 14 oz. Œdema now extending up the legs.

February 6.—Patient in a state of stupor. Urine 14 oz., but no albumen could be detected. He gradually became weaker and died on February 8, apparently from uræmia and heart failure.

Post mortem.—Great emaciation, hyperflexion of joints. Scalp and face: hair very thin, skin red, covered with small scales; skin generally of a diffuse red colour, neck like raw ham; very marked hypostatic congestion, considerable œdema of limbs. Lungs bronchitic. Heart hypertrophied, no valvular lesions; aorta atheromatous. Liver, spleen and kidneys markedly congested. Intestines also very injected.

PRESENTATION TO DR. PATRICK MANSON, C.M.G., F.R.S., LL.D.—At the meeting of the British Medical Association at Cheltenham, the President presented Dr. Manson with the Stewart Prize. The award consisted of an illuminated scroll and a cheque for £50. The prize is given for the encouragement of the study of epidemic diseases, and it has never, in our opinion, been bestowed on anyone who more richly deserved the compliment. We congratulate Dr. Manson.

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THE Journal of Tropical Medicine

AUGUST 15, 1901.

CHELTENHAM.

THE Meeting of the British Medical Association, at Cheltenham, was an unqualified success in every way. The attendance at the sections was good, the subjects discussed were in many instances very interesting, and the social and other arrangements were highly creditable to the local committees.

What, perhaps, was the most striking and in the majority of instances a surprising feature to the assemblage at Cheltenham, was Cheltenham itself. In our text-books in medicine and therapeutics we are accustomed to see the place prominently referred to as a watering place of importance. Careful analyses also are given of the composition of the various waters which give Cheltenham its reputed pre-eminence as a resort for invalids, and the waters of the Spa are commended specifically for several ailments.

What we were not prepared for on going to Cheltenham was to find that it was not a resort for invalids at all, or only to an infinitesimal extent. The medical men there state that patients are sent to them occasionally from many parts of the world in the belief that the Spa is in full swing, and that treatment by drinking the impregnated waters, baths, &c., is a matter of routine. Unfortunately there is no systematic *régime* of the kind available. As a watering place, Cheltenham has fallen behind in the race, it is neglected and passed by, and this too, for no reason evident to the visitor. The waters are as potent and as plentiful as ever; they are calculated to relieve the ravages of gout and hepatic ailments, and the troubles that are grouped together as being due to residence in hot climates. A glance at the composition and character of the waters will serve to indicate the diseases in which they are likely to prove useful.

The mineral waters, which are none of them thermal, may be classified in three groups.

(1) Magnesia-saline group, represented by the Chadnor Villa and Cottage Wells, which contain, in addition to sodium sulphate and chloride, considerable quantities of magnesium sulphate. These aperient waters promise to prove suitable for drinking purposes in the class of cases in which benefit is derived from the Carlsbad course.

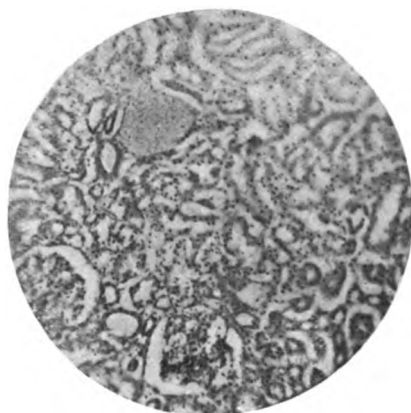
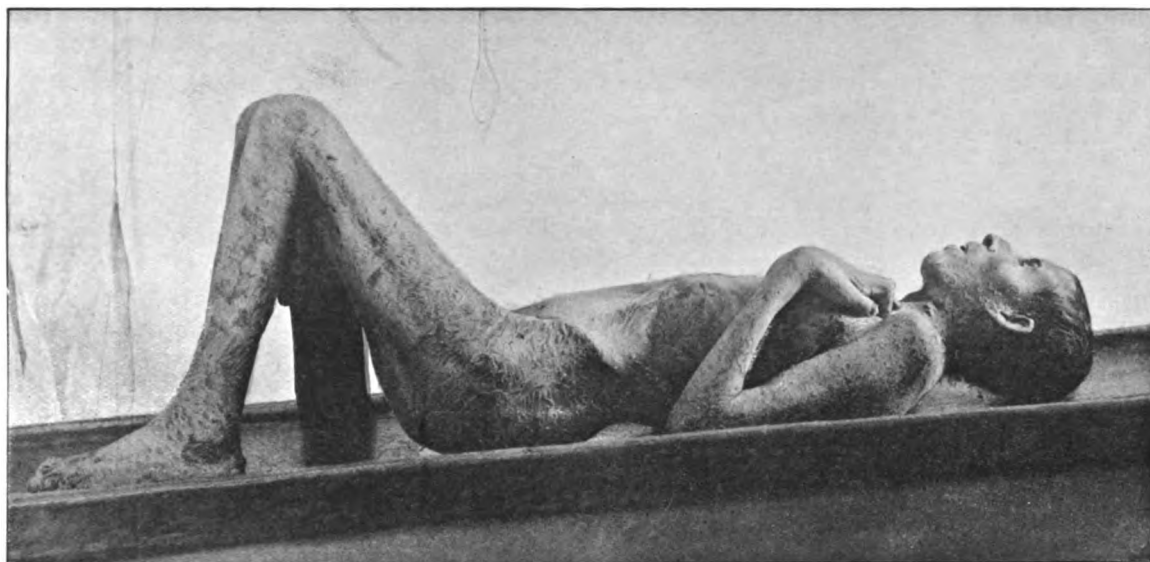
(2) Soda saline waters, in which sodium chloride and sulphate are the chief ingredients. Of these, the springs known as Pittville I., II., and III., are the most important sources, and it is proposed to utilise the springs I. and III. for the supply of baths.

(3) Chalybeate waters, of which the Cambray chalybeate is the chief representative.

The Cambray chalybeate contains iron in the form of carbonate, and deposits a red sediment of oxide on standing.

When we turn to the appearance of the city and its environments, the stranger to Cheltenham is surprised indeed. It is undoubtedly one of the most beautiful towns in Britain, and compares favourably with any of the watering places on the Continent in attractiveness.

Cheltenham has been named the "garden city,"



Photographs illustrating the article on Exfoliative Dermatitis, or Pityriasis rubra.

By Staff-Surgeon P. W. BASSETT-SMITH, R.N., Haslar.



and well it deserves the title. The principal streets are adorned by well-grown trees, sometimes, as in the wide promenades through the centre of the town, in four rows; chestnuts and limes prevail, and their ample foliage afforded very grateful shade during the hot weather that was experienced during the "Association week." Public and private gardens abound, with the result that the area covered by the city is of great extent; so much so that in place of the 50,000 inhabitants—the present population of Cheltenham—three times that number might find ample space were the streets laid out as in most other cities.

The Pittville Gardens, the resort of those who came for "the cure" in days gone by, are surely a masterpiece of the gardener's art. It is here, also, that the pump-room is situated, an excellent piece of masonry set in a beautiful surrounding. The building, with its vaulted roof, Corinthian pillars, and general appearance, reminding one of a Greek temple.

Other public gardens of great beauty there are in plenty, and yet, with all that nature and art can do to attract, Cheltenham has lost the place which belonged to it some seventy years ago.

One naturally asks, why? It is not that the waters have lost their power to "cure"; it is not that the city has declined in beauty, for time has but served to enhance the quality of the lawns, the foliage of the trees, and the general attractiveness; it cannot be that the country around is less featureless, for the Cotswold Hills remain, and every acre of ground almost in this neighbourhood is pregnant with historical interest.

It is fashion that has changed. When to reach Cheltenham was considered a journey, its waters were considered highly efficient and the beauties of the place were lauded. When, however, steam came in and shortened distance, the Continental Spas became fashionable and "home" resorts were neglected.

Other explanations are offered, namely, that a section of the townspeople do not want to see the place crowded with invalids. The development of schools also is another reason assigned for the want of enterprise in attracting invalids, for

Cheltenham has become a great centre of education. There is, of course, the Cheltenham Public School, but besides this, and of more recent growth, is the Ladies' College, a seminary of leviathan proportions, and many other public and private schools of considerable pretensions.

These are some of the explanations given for the decline and fall of Cheltenham as a health resort. It is said, and we believe with some reason, that all this is to be changed, that an endeavour is to be made to restore Cheltenham to its proper place amongst British Spas. We wish the pioneers of this movement every success, and that speedily. We are confident that all the members of the British Medical Association who were made acquainted with the possibilities of Cheltenham will enthusiastically favour its advancement. Cheltenham is so centrally placed, so near the great centres of population, so attractive in every way, that we should be glad to see a recrudescence in its prestige as a resort, and for the sake of the many invalids to whom the long journey to a more distant home or Continental watering place is dangerous or impossible.

LECTURES AT LAGOS ON "HEALTH" IN THE TROPICS.

At the suggestion of His Excellency Sir Wm. Macgregor, a course of ten lectures on "Health" have been delivered free to the community in Lagos, West Africa. Especially was it desired that sanitary inspectors, hospital nurses, and teachers in the Government schools should attend these lectures. At the completion of the course an examination was held and certificates distributed entitling the students to teach a "Health" class in the public schools of Lagos.

The wisdom of this step, the enlightened policy that initiated so useful a programme, and the great possibilities likely to ensue from the course of instruction, cannot be too highly commended and admired. We hope the example set in Lagos by Sir Wm. Macgregor will be followed in every colony and protectorate throughout the Empire.

We should like to publish the course delivered by Dr. W. H. G. H. Best, Resident Medical Officer, Lagos, and Dr. T. E. Rice, Assistant Colonial Surgeon, Ibadan, in full, did only space permit. As others may wish to imitate the example, we append the syllabus of instruction, and give the introductory and the third lectures as types of the course.

LECTURE I.

Introduction—Scope of Course—The Importance and Prevalence of Malarial Fever in Lagos—Co-operation of the People necessary—The Necessity of Teaching the Outlines of the Subject to Children at School.

LECTURE II.

Nature of Malarial Fever—A Malady exclusively Human—A Disease given by Mosquitoes to Man—How Communicated from Man to Man—Growth of the Parasite in the Mosquito.

LECTURE III.

Mosquitoes, their Eggs, Larvæ, &c.—Effects of Winds on Mosquitoes—Effects of Light.

LECTURE IV.

Water in the Propagation of the Mosquito—Water indispensable to Egg and Larva—Running, Still, Fresh, and Brackish Water—Aquatic Plants, Clean and Dirty Water—Clay Holes, Swamps, Pools, Flower Pots and Gardens—Reclamation, Drainage—Petroleum.

LECTURE V.

Water for Domestic Purposes—Water Barrel, or Tin—Water Tanks—Wells—Rainwater—Drought.

LECTURE VI.

Insecticides—Solutions—Powders—Gases—Plants—Leaves of Trees—Smoke.

LECTURE VII.

The Mosquito Net—Isolation of Fever Patients—Special Care of Children—Administration of Quinine—Search for Mosquitoes.

LECTURE VIII.

Dysentery—Mortality from—How it is spread—To Preserve Water from Pollution—Disposal of Dysenteric Stools—Boiling and Filtering of Water—Water from Clay Pits Dangerous.

LECTURE IX.

Rainwater and its Advantages—How to Collect and Store it—Advent and First Symptoms of Dysentery—Steps to take on behalf of Patients—Necessity of Cleanliness on behalf of Others.

LECTURE X.

The Cause, Prevention, and Treatment of Malaria—Geographical Distribution—Influence of Heat and Cold and of Season—Influence of Local Conditions—Moisture—Influence of Rainfall, Winds, Trees, and of Soil—Prevention.

We here append the Introductory Lecture and the Third Lecture as examples of how such subjects may be dealt with so as to instruct the public.

LECTURE I.

Introduction.

It is at the suggestion of His Excellency Sir William MacGregor that a course of ten Lectures on "Health" with illustrations will be given gratuitously, and it is His Excellency's wish that sanitary inspectors, hospital nurses, and teachers in the Government Schools must attend and pass the examinations, else they will be unfitted for their posts.

At the end of the course the students will undergo examination. Those that pass the examinations successfully would receive a certificate stating that they have attended the Lectures and are qualified to teach a class of "Health" in the public schools of Lagos.

The certificated teachers would teach to their own classes the substance of the lectures delivered to them in this course.

The scholars would be examined in the "Health" class as in any other, and marks would be allowed on a scale to be determined by the Board of Education. The teaching of "Health" would count to the teacher the same as other teaching and on a scale to be determined by the Board.

Special prizes may be offered to both teachers and scholars.

Scope of the Course.

The objects of this course are to convey to its students a general acquaintance of matters connected with "Health," but we shall more particularly consider two of the diseases that are of most frequent occurrence in Lagos, viz., fever and dysentery.

Malarial fever is the principal fever here.

Malaria used to flourish at one time in England.

The following extract from Graham's "Social Life of Scotland" in the eighteenth century shows what an important part it played in the life of the Scottish peasants:—

"The one ailment to which they were most liable and in which dirt had no share was ague (fever). This was due to the undrained land, which retained wet like a sponge, and was full of swamps, bogs, and morasses in which 'green grew the rushes.' Terribly prevalent and harassing this malady proved to the rural classes, for every year a vast proportion of the people were prostrated by it, so that it was extremely difficult to get the necessary work of the fields performed in many districts. In localities like the 'Carse of Gowrie,' which in those days abounded in morasses and deep pools, amongst whose rushes the lapwings had their haunts, the whole population was every year stricken more or less with the trouble, until the days came when drainage dried the soil and ague and lapwings disappeared."

In England King James I. died of ague near London, and the great Cromwell succumbed at Whitehall also to fever in 1658, a year in which malaria was widely spread and also very deadly. It is only within recent memory that the Fen districts in England, the marshy districts of Kent and Somerset have lost their evil reputation for malarial fever; by the improved sanitation and drainage, and the taking of quinine, all this has disappeared, and at present malaria appears to be unknown in England.

In the German army in the year 1869, 13,563 cases occurred, in 1897 only 230 cases when quinine was used.

The Importance and Prevalence of Malarial Fever in Lagos.

It has been said that half of the mortality of the human race is due to malaria. This may very well be an exaggeration, but there can be little doubt

that of all the ills that flesh is heir to malaria is the most deadly, and exercises the most profound influence on the distribution and activities of man. It is by far the most important disease in the tropics. Not only does it give rise to grave and sometimes fatal fevers, but in consequence of its prevalence and its weakening influences, it undermines the health of millions, making them an easy prey to other diseases, which it complicates and makes worse, and otherwise unfitting them for the active business and enjoyment of life. Directly and indirectly it is the principal cause of sickness and death in the tropics. More than one-fourth of all deaths in Lagos are caused by it.

Malarial fever when it does not kill leaves great weakness behind, and all who have watched malarial patients or patients who are already recovering from an attack cannot fail to have noticed the carelessness and want of interest in their surroundings, and the lack of wish to work that they show. Apart from the direct mortality, the disease probably levies a heavier toll on the capacity of the general inhabitants, the officers, *employés*, and others who build up and administer the British Empire than does any other single agency.

Malarial fever is now known to be curable; therefore, as soon as malaria is recognised, unless there be some very good reason to the contrary, your first duty is to give quinine. There are many ways of giving this drug. However given, care must be taken that it is given in such a way that there can be no mistake about its being taken up into the body, as the food or water we eat and drink. If the patient for any reason, such as inability to swallow or persistent vomiting, cannot take it by the mouth, then it must be given by the rectum in the form of an injection, but if the circumstances of the case are such that a rapid action of the drug is required, then it may be injected under the skin.

Co-operation of the people necessary.—The inhabitants of malarious districts ought to live in towns or villages, well built houses, broad open streets, well drained. The houses, if possible, should be placed on high and dry situations and raised above the ground; it is unwise to place dwelling-houses in exposed situations where high winds are apt to produce chills and consequent fever relapses. For the same reason in elevated situations houses should be well sheltered by trees planted at some distance from the premises, or by higher ground. The grass should be left undisturbed around the houses and kept cut regularly; all exposed soil should be covered with rammed earth. It is most unwise to have flower beds or vegetable gardens near bedroom windows, or to allow water from bath room or cook houses to flow over the ground near the house, or to keep water unchanged in tub or water butts for mosquitoes to breed in. Pools and puddles of stagnant water should be filled up and rammed down with earth and grass planted. The neighbourhood of swamps is to be avoided. There is a fish in Lagos called "Ojiji" which should be cultivated and placed in ponds, and in the pots where your water is stored, as it keeps down mosquitoes by eating up their larvæ, those little wriggling brown creatures so commonly seen in the pools of water, and which wriggle to the bottom when disturbed;

mosquitoes grow from these little creatures. Broken glass bottles should not be placed upon walls, nor broken calabashes, pots, cocoanuts, left lying about, as water collects in them and mosquitoes breed. All pots and pans containing water should be regularly turned out once a week and puddles should be brushed out. The larva takes some seven days to develop, so that once a week suffices to destroy each brood. All useless water should be drained away and stagnant ponds filled up.

One of the simplest ways to destroy the larvæ of the mosquitoes and to prevent them depositing their eggs on the surface of water is kerosene oil. A piece of rag tied to a stick should be dipped into the oil and then applied to the surface of the water. The oil spreads out like a fine skin over the surface, and entering the breathing tubes of the larva it dies suffocated and choked. Fresh tar has the same effect. This "painting" of the water must be renewed once a week. Wells and tanks should be kept closed.

A more careful selection of the site for houses and a liberal use of wire mosquito-proof netting for shutters will do much to lessen the risk of malaria. Walls of rooms should be painted white to make easy the discovery of mosquitoes. Beds should be provided with fine muslin mosquito nets.

As those suffering from malarial fever are dangerous to their companions because they give them fever, they should as far as practicable be avoided and compelled to use efficient mosquito nets.

Quinine to be taken, as the parasite is very easily killed by it, owing to its poisonous action, and this is especially the case at the time when the seeds of the parasites are forming and are being set free in the blood.

The necessity of teaching the outlines of the subject to children at school, so that they may obtain a mastery of the subject, know one family of mosquito from another, and understand the relation between fever and mosquitoes. It is said that 57 per cent. of children up to 8 years of age and 28 per cent. of children up to 12 years are thoroughly full of the parasites, and hence highly dangerous to their neighbours. If these can be taught to use mosquito nets and take quinine in their early days, much will be done towards reducing the number of infected mosquitoes and consequently malaria.

At the suggestion of His Excellency the Governor, a "Ladies' League" has been formed in Lagos, the principal function of which is to administer quinine to young children.

The many difficulties and the great responsibilities of the members of the League are fully recognised, but there is every assurance that these difficulties will be met with wisdom, and the responsibilities undertaken with a conscientious desire for the good of all classes.

How this can best be done.

It should form the subject of teaching in all the public schools of Lagos, and to encourage them special prizes might be given in the malaria class.

LECTURE III.

Mosquitoes and Malaria.

The word mosquito means a "little fly." It is used popularly to denote a gnat which bites; and

most gnats bite when they have a chance. There are about 250 species of mosquitoes.

The mosquito is the carrier of the germ of malaria, and rises from pools of water from the ground.

This mosquito-malarial theory was first formulated by Dr. Manson. For two and a half years Major Ross dissected mosquitoes looking for traces of malaria and finding none, but at last he found what he sought in a species of mosquito called *Anopheles*, the mosquito with the spotted wings and boat-shaped eggs; and only the species of this family, so far as we know, are capable of conveying the infection from man to man. In their bodies only will the germ develop, and the mosquito acquires the germ by sucking the blood of an infected man. It is of practical importance, therefore, to be able to recognise, if not the species, at least the family to which any given mosquito belongs.

The adult mosquito may live for months. They feed on fruits, birds, animals, as well as on man, but only the female sucks blood, the males living on fruits and leaves. They are, however, very fond of wine, and may be seen staggering about in the most ridiculous way—evidently drunk. After feeding on man the female generally sleeps, gorged, all day on the wall of a room or other dark place. Every few days she flies back to the water where she was bred, and where she lived as a larva, or else to some other suitable spot; she lays her eggs, and then returns again, probably to the same place where she first fed. Hence mosquitoes which feed on man generally breed in water near houses.

There are two great families of mosquitoes. (1) The *Culex* family, and (2) the *Anopheles* family.

Culex do not carry the malaria germ. *Culex* have short palpi, they breed in almost every vessel of water, empty calabashes, flower pots, tubs, &c., in which rain-water collects.

The eggs are laid on the surface of the water; they form tiny boat-shaped masses, about 200 to 400 eggs in each batch, which float on the water like specks of soot. From each egg a little larva is born. They are laid in the early morning and are hatched out in about sixteen hours.

Larvæ live and grow in water and become nymphæ in about seven days. They are very active little creatures, feed greedily on any animal matter. They come to the surface of the water with a series of jerks and wriggings of the tail, to breathe with head hanging vertically down; the air-tube terminating at the tail extremity in a long breathing tube causes this attitude. When disturbed they sink rapidly to the bottom of the water. They are larger than those of *Anopheles*, and have a prolongation at the tail, and live in pots, drains, tanks, and swamps, &c.

Nymphæ differ most pronouncedly from the larva in the great swelling of the chest parts. It is lighter than water, and remains motionless at the surface, but when disturbed wriggles to the bottom with difficulty, when it ceases to exert itself it gradually floats up to the surface. It floats with its head upwards, and after two days the mature insect steps out of the floating skin that the nymphæ lived in.

Mature Insect.

The male has long palpi nearly as long as the proboscis, with five segments; the female has very small palpi with three segments; the wings are unspotted. When at rest on a plain surface it assumes a position more or less with the axis of its body parallel to the surface. The short palpi of the female *Culex* distinguishes it from the female *Anopheles*. Its attitude is angular, humpbacked.

Anopheles.—The malarial-carrying mosquito with long palpi and spotted wings. It bites at sunset and sunrise, probably also during the night, and breeds chiefly in small pools of water on the ground containing green water-weeds. It is a rather large mosquito and is very bloodthirsty. The eggs are laid in natural collections of water in lots of 40 to 100 floating close to each other, e.g., stagnant pools and ponds, small sluggish streams which are free from fish, and which preferably contain green weeds. They are generally arranged in loosely connected masses of three or four and attach themselves to weeds, sticks, leaves, &c. In three days they develop into larvæ.

Larvæ live in pools of water containing green weeds which they feed upon. They are very active, wriggling little creatures, and come to the surface of the water to breathe with the body lying parallel to the surface and immediately below the surface film, so that portions of its head as well as its breathing tube are out of the water. The air-tubes terminate near the tail end without any breathing tube, so they have no prolongation at the tail. When disturbed they glide away tail first, close to the surface of the water, with a skating kind of movement, lashing their tails sideways. They are smaller than those of the *Culex* and live in pools or ponds with green water-weed, upon which they feed. In about sixteen days they develop into the nymphæ, and they develop into the mature insect five days later.

Mature Insect.

Both male and female insect have long palpi; each palpus has five segments. They have spotted wings. When at rest on a plain surface, it assumes a position more or less at right angles to the surface; it is all in one line. It is only the female that sucks blood.

The *Anopheles*, as it is readily infected by the human parasite, is therefore well worth studying. Its boat-shaped eggs give rise to charming little larvæ whose diet of minute algæ gives a greenish tinge to the centre of the body which elsewhere is of a brownish colour.

When at rest these small larvæ float on the water, parallel with the surface, and not hanging down as does the larvæ of the *Culex*. They have a most beautiful arrangement of minute hairs arranged like the ribs of an umbrella turned inside out along the upper surface of their backs, and by the action of these hairs they hang on to the surface film of the water. Their breathing organs open near the tail but are not produced into the long breathing tube by which the *Culex* larvæ can be so easily recognised. They possess the most marvellous arrangement on the head for setting up currents conveying food to the mouth, and in fact they afford one of the most

charming objects of "animated nature" that one could desire to watch. After some days, varying according to the temperature, the larva turns into one of those curious active winged nymphs. The nymph floats on the surface of the water, and when mature the skin splits along the back, then the perfect insect steps out, rests a moment to dry its wings, and sails away into the air.

The *Anopheles*, unlike the *Culex*, which breeds close to houses in tanks, drains, &c., prefers rain-water puddles, natural hollows by the wayside, small ponds, and in shallow water easily heated by the sun's rays where green water-weeds abound, such as small running streams.

During the day they always choose the darkest places to rest, and sit in a highly characteristic attitude, their bodies being held almost at a right angle to the wall. They are usually to be found in the darkest corners, not infrequently beneath tables, chairs, behind pictures or hats on the wall, and on the darkest parts of painted walls, and unless disturbed they do not as a rule bite except at night.

Effects of Wind on Mosquitoes.

The frail mosquitoes do not resist the wind, therefore when it blows they remain in their hiding-places, clinging to branches of trees and grasses, sheltered by the close-clustered foliage, and do not come out, nor do they attack man at sunset, but when the wind subsides they swarm out in flights. It is possible that light winds may cause mosquitoes to spread, but as a rule they tend to diminish their number in the air. They have been known to travel fifteen miles. The hours in which mosquitoes are to be found most plentifully are in the evening and night; by day they live hidden away and sheltered, but when the wind blows they do not come out of their hiding places. They do not wander from the place where they are born, and especially they fly at little distance from the ground. They have, however, been found to visit ships in the harbours, and this explains how malaria fever breaks out after a ship that has visited malarial ports has gone out to sea. It is said that with light winds they can travel three miles, so that they can easily cross the Lagos lagoon, and by flying obliquely upwards can attain a height of 1,000 feet. Some mosquitoes have been found at very high altitudes; His Excellency the Governor has seen them very bad at 6,000 feet, and also at 10,000 feet up mountains, so you see altitudes alone cannot be taken as a guide to safety from fever. At Sierra Leone, for instance, Wilberforce Village is 700 feet high, but malaria and *Anopheles* are very plentiful there.

Shady damp woods and trees in general are the nests of mosquitoes. The mosquito besides being a source is consequently also the carrier of malarial infection. Woods do not, as was once said, filter malarial germs. Mosquitoes rest in trees, and trees help to drain the soil, and so prevent pools forming wherein mosquitoes might breed.

Effects of Light.

Mosquitoes do not like the light, therefore they hide in the daytime, choosing the darkest spots, clumps of trees, &c., and come out at night to feed,

but on dull days they will bite during the day or among trees where there is shade.

Mosquitoes may be carried long distances by railway trains. The railway carriages often contain hundreds of mosquitoes, and in this way unlimited numbers of mosquitoes are carried to great distances; they emerge from the cars and start to breed, so that regions where mosquitoes are ordinarily rare may become infected by them, and in this manner malaria spreads.

THE NEW HOSPITAL FOR THE CURE OF TUBERCULOSIS IN TENERIFFE.

By DR. STANFORD HARRIS.

Las Palmas, Grand Canary.

THE treatment of tuberculosis, which has now become associated in the English mind with the expression "Nordrach treatment" (from the fact that the Nordrach Sanatorium is the best known to the British public) has for its successful working a hundred or more details, but the essentials can be given in a few words. They are: A continuous supply of pure air, overfeeding, rest (complete while there is any fever), graduated exercise, absence of all injurious surroundings, such as one meets with in the recreation rooms of an ordinary hotel.

This treatment, be it good or bad, is about to be tried by the almost unanimous verdict of the laity and faculty. It is, moreover, founded on a scientific truth. There are very few diseases which drugs alone can cure, and consumption is certainly not one of these. It is now fairly well known to the public that the blood has within it the necessary material for combating and destroying an ordinary dose of most diseases. If the dose be large, the victim old or in bad health, the disease conquers and the patient dies. It is often the duty of the physician to simply watch Nature cure, keeping guard, meanwhile, to see that nothing that Nature is calling for should be wanting, or that anything which would fight on the side of disease should be permitted in the neighbourhood of the sufferer. This is the essence of the so-called Nordrach treatment. The medical director of the new hospital for tuberculosis in Güimar, Teneriffe, is endeavouring to introduce into the details of the treatment there the good points from each of the now existing sanatoria of Europe, and in some particulars to go one better, as, for example, the abolition of reception rooms.

The advantages which he claims for Güimar are best explained by quoting from a letter written by him, which appeared in the *British Medical Journal*, July 15:—

"CLIMATE AND THE CURE OF CONSUMPTION.

"SIR,—For many years past the Canary Isles and Madeira have been the resort of tuberculous patients, and, with few exceptions, the effect of the climate has been only to keep the patients alive, it has not cured them.

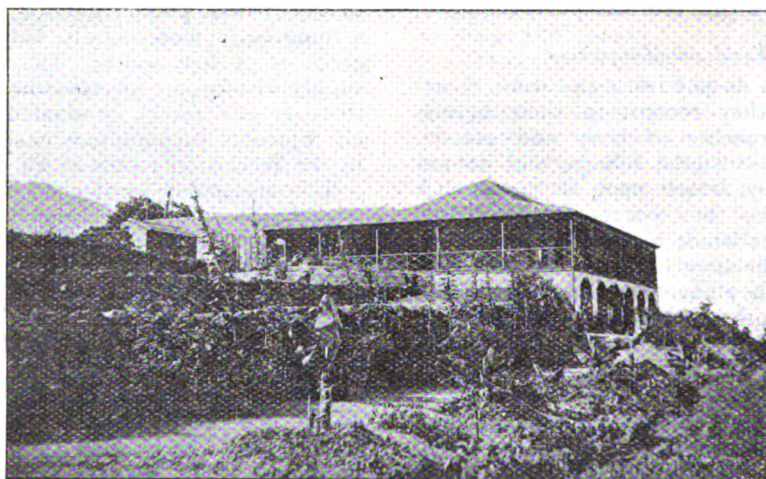
"Now, therefore, there is a reaction in the minds of medical men and the public generally against sunny climates, and almost all sufferers from phthisis are advised to 'stay in their own country and to be treated in suitable sanatoria.'

"The object of this short paper is to suggest that if suitable hospitals were to be built in such climates as we enjoy in the Canary Islands, then, but not till then, these resorts would be superior for the treatment of consumption to such climates as those of England, Belgium, Germany, and even France, where the variations in temperature are so great and the number of cloudy days so many.

"Up to the present time patients have been treated in hotels, where the hours kept and the amusements offered are directly contraindicated in the proper management of the disease. It is proposed shortly to erect a hospital in Teneriffe, where the inmates would be treated in every detail on the Nordrach principle. They would sleep in rooms built for the purpose, and spend their days on verandahs, lying in the sunlight and fresh mountain air. They would regulate their day and night in accordance with the days and nights of this sub-tropical land, that is to say, they would breakfast

Güimar is undoubtedly the fruit garden of Teneriffe, and has a climate which, for the treatment of chest disease, is unique. I feel sure that in the great yearly rush of health-seekers to the Canary Islands, the valley of Güimar will in the near future become one of the most favoured resorts.'

"In conclusion, it may be well to give a few instances of the value of breezy mountain air as opposed to the relaxing air at the sea-level, such cases being personally known to me. In passing, it may be permissible to say in answer to the statement sometimes made, that the resorts now in use at the sea-level, such as Las Palmas, are actually unhealthy, that during the four years in which I have been resident in the town of Las Palmas, I have not had occasion to sign a single death certificate for anyone resident in the English hotel in the town. In the Spanish hotel I have had one death from tuberculosis, and in the English hospital in the Port one.



VIEW FROM THE HOSPITAL GROUNDS AT GÜIMAR.

at 7.30 or even earlier, and retire for the night at 6 or 7. The proposed building will have no reception rooms whatever, the patients taking all their meals on their verandahs. When convalescent they would be allowed walks and drives, and finally be passed on to an hotel close by where there are such amusements as billiards, lawn tennis, &c.

"After nearly four years' residence in the Canaries, I have come to the conclusion that the two most suitable spots for hospitals such as I have briefly indicated are Monte in Grand Canary, and Güimar in Teneriffe. The first venture will be made in Güimar. Dr. Wharry, of London, writing on Güimar, says:—

"The Marquesa's house (El Buen Retiro), where accommodation has now been provided for a small number of English visitors, is prettily situated at an elevation of 1,200 feet above the sea. It has a very lovely shady garden, in which mangoes, custard-apples, oranges, pomegranates, and apples flourish as they do nowhere on the northern side.

"A., now in Monte, has a normal temperature when in the mountains, but 103 to 105 degrees when in Las Palmas.

"B. has normal temperature, no hæmorrhage, and increases in weight while at Monte. Whenever he returns to Las Palmas he has high temperature and some hæmorrhage; this occurs if he stays but two days at the sea-level.

"C. has high fever at the sea-level, normal temperature in the hills.'

"These cases could be multiplied indefinitely. In fact, the only cases which seem to require the lower level are the hopeless ones, and of course in their case this is only a palliative.

BERI-BERI ON BOARD SHIP. IS BERI-BERI DUE TO CARBONIC ACID POISONING?

By ALBERT S. ASHMEAD, M.D., New York.

In two letters which we publish Dr. Ashmead's views on the etiology of Beri-beri are enunciated.

LETTER I.

To the Editor of the "New York Times."

Will you permit me to observe regarding your notice of beri-beri on the schooner *Alert* that I have analysed the situation of several beri-beri ships, in respect to the cause, and I have always found some source where the poison of carbonic acid gas came from plentifully. I maintain, even against the Dutch East Indian doctors (beri-beri specialists of Java), that in all these outbreaks on ships it is some emanation of carbonic poisons which lies at the bottom of the trouble. The food has nothing to do with it. Beri-beri means "goat's gait" or "sheep's run," and it has reference to the symptoms of paresis of the nerves of the legs, always symmetrical; the dropping of the toes, or pes equinus; and the laboured lifting of the leg and thrusting it forward, due, in my opinion, to carbonic poisoning of red blood corpuscles and peripheral nerves. The quick recovery of all crews as soon as they are removed from the ships to a purer atmosphere is the same effect which the Japanese obtain by removing their sick from the low-situated wards of Tokio to higher ground. They thus obtain for them an increased supply of oxygen. Carbonic acid gas being heavier than air, sinks to the lowest levels, where, in Japan and the East, are always found the worst type of the disease.

In my special inquiry into diet as a cause, the captains of ships have told me that the food throughout the voyage, of those who escaped and those attacked, was identical. I found, too, that worm-eaten rice of ships could not have produced beri-beri, otherwise all the negroes of the Savannah delta, upon whom the damaged rice is usually bestowed, would be permanent prey to beri-beri.

Beri-beri is not contagious, so that there is no need of disinfection. If the deficiency of haemoglobin of the blood (there is never deficiency of red blood corpuscles in beri-beri) was due to a micro-organism, as some beri-beri specialists claim, why is not the spleen enlarged? And why are children and women in Japan so seldom affected? Nearly always men, and very robust ones, are affected with beri-beri.

Dr. Takaki's Japanese theory that rice produces beri-beri does not hold water. All that rice may have to do with it is that it represents insufficiency of alimentation. You might as well incriminate the oatmeal when, as it so often happens, beri-beri breaks out in a Scotch crew.

LETTER II.

To the Editor of the "Evening Telegram."

The disease beri-beri, reported as having attacked three of the crew on a Nova Scotian schooner which arrived to-day from Lagos, West Coast of Africa, by way of St. Martins, is the same disease that attacked the crew on the *Robert S. Patterson*, from Navassa Island, in 1894. I investigated that case with the Japanese physician, Dr. Tschupija.

The ship had left Navassa fourteen days before her arrival at Perth Amboy, N. J. While loading phosphate earth as cargo seventy-four negroes begged Captain Barton to bring them home. Some of them had been there for a year. Sickness developed on the trip and three died and were buried at sea. A fourth died off Sandy Hook. An analysis of the phosphate earth of Navassa showed 3.98 per cent. of carbonic acid out of 100 component parts of bone phosphate of lime. The earth's composition was fifty-five grains silician matter, forty-five grains soluble matter, three-quarter

per cent. carbonate lime, and really a deposit of coral or sea shells, or coprolite insects of sea decay.

On visiting the *Robert S. Patterson* at Perth Amboy I found one man lying dead, two others dying, and ten others in various stages of beri-beri (kakke) as I had known it in Japan.

These seventy-five men, who had worked in the phosphate quarries, had been shipped in a space less than five feet high, thirty feet wide and fifty feet long. This space had no port holes. Even a considerable part of space was filled with phosphate earth or cargo. In a space of 7,500 cubic feet seventy-five men lived thirteen days with the least possible ventilation, with four lanterns consuming part of the oxygen necessary for life, with all the foulness engendered by breathing, &c. These men were very poorly clad, and coming from many hardships suffered in a tropical climate, were so apathetic that nothing could induce them to go on deck for fresh air. It was evident in that case, and it is probably true also of the Nova Scotia schooner *Alert*, that carbonic poison was the cause of illness. Beri-beri is not the "sleeping sickness" of Africa.

The following query is appended to these letters by Dr. Ashmead: "If the Manchester (England) cases of beri-beri were caused by arsenical (beer) poisoning, why are not all cases of beri-beri due to some chemical poison?"

Facts and Notes.

THE FIRST EGYPTIAN CONGRESS OF MEDICINE.—The first Egyptian Congress of Medicine, under the distinguished patronage of His Excellency the Khedive, will be held at Cairo in December, 1902. The papers to be read and discussed at this important meeting will be principally in reference to the diseases peculiar to Egypt. A number of well-known medical men will contribute reports and send communications, a brief summary of which is here appended:—

Hepatic Abscess (Drs. Cartoulis, Voronoff, Colloridi, Comanos Pacha, and Legrand); *Alcoholism and its Advance in Egypt* (Dr. de Becker); *Anchylostomum Duodenale* (Drs. Sandwith, Loos, and Ruffer); *Bilharzia Haematobia* (Drs. Milton, Morrison, Goebel, Colloridi and Trekaki); *Cordiopathia in Egypt* (Dr. de Semo); *Dysentery* (Drs. Cartoulis and Hess Bey); *Epidemics in Egypt, their Prophylaxis, and the Means for combating them* (Drs. Bitter, Engel Bey, and Crendiropoulo); *Bilious Fever* (Dr. Valassopoulo); *Malarial Fevers* (Drs. Dreyer and Fornario); *Filariasis in Egypt* (Dr. Madden); *Haschisch Insanity* (Dr. Warnock); *Conjunctival Granulations in Egypt* (Drs. Eloui Bey, Sameh Bey, and Lakah); *Prevalence and Treatment of Hydrocele in Egypt* (Dr. Colloridi); *Medicine amongst the Arabs* (Dr. Eid); *Myxædema in Egypt* (Dr. Brossard); *Ophthalmia in Egypt* (Drs. Demetriades, Voilas, and Sameh Bey); *Plague* (Dr. Gotschlich); *Tuberculosis in Egypt* (Drs. Ibrahim Pacha, Hassan, Eid, and Sandwith).

There is no doubt that the scientific and practical importance of this, the first Medical Congress of Egypt, will arrest the attention of medical men in all quarters of the globe. The attendance and co-operation of all those interested in tropical and

subtropical medicine is cordially invited by the promoters of this enterprise.

We hope later on to be in a position to publish in our columns some of the papers read at this important meeting, and take this opportunity of wishing it every success, a wish in which we feel our colleagues will join.

FOR DIAGNOSIS.

A NEW DISEASE IN INDIA.

We have had forwarded for our opinion a description of a disease which we will leave our readers to express themselves upon. We have not obtained permission to publish the name of the writer of the letter sent to us, but we hope he will give us it in due course.

"My object in addressing you is to ascertain the name, pathology and treatment of a certain new disease which has lately made its appearance in some parts of East Bengal.

The brief symptoms of this new disease are that it attacks the patient with a burning sensation in the soles of the feet, followed by a swelling and burning of the skin thereof, and finally the skin covering the feet becomes hard as wood. Gradually, as the disease advances the whole surface of the body assumes a dark blue colour. After a month, or a month and a half, the patient becomes bedridden, his eyesight diminishes, complete anæmia supervenes and the skin of the entire body is fissured. At last, when the face is cracked, slight fever ensues, vomiting sets in, and the patient succumbs within three or four months. Further, it is curious that if boiled or cooked rice is kept in the infected house, even for a single day, it also turns black. Some few years ago the same disease also appeared, but none of the doctors were able to find out the real cause, and not a single patient recovered.

India, July 11, 1901."

Current Literature.

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Ichthyol	1 dr.
Alcohol	3½ dr.
Ether	3½ dr.

Apply with camel's-hair brush. The alcohol and ether must be mixed first before the ichthyol is added.

—*Merck's Archives*, July, 1901.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Exercito.
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
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2.—Manuscripts sent in cannot be returned.

3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

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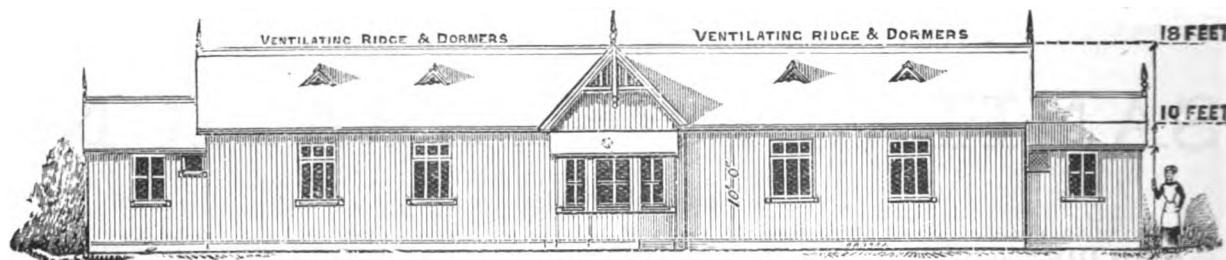
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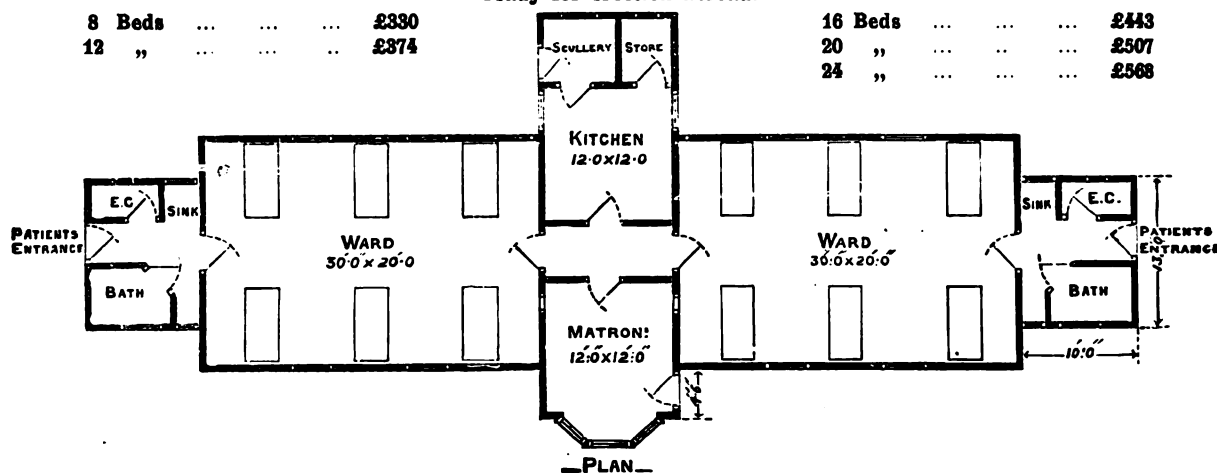


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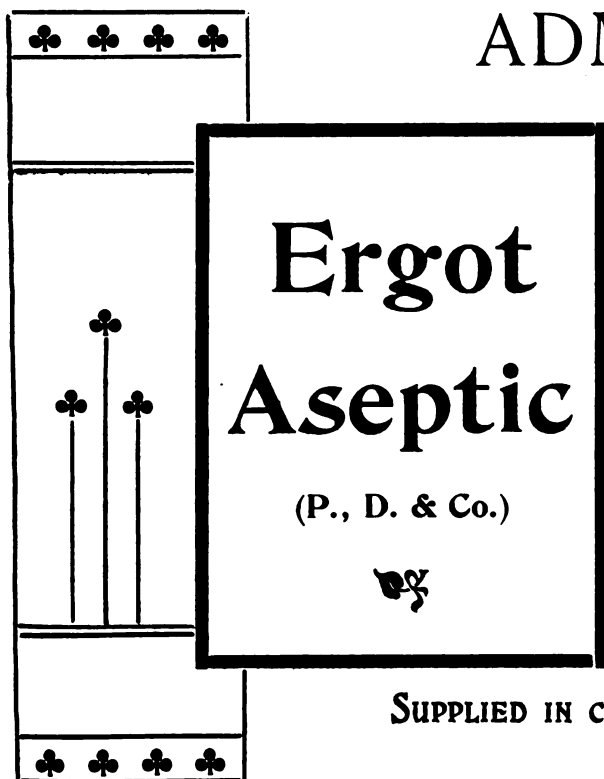
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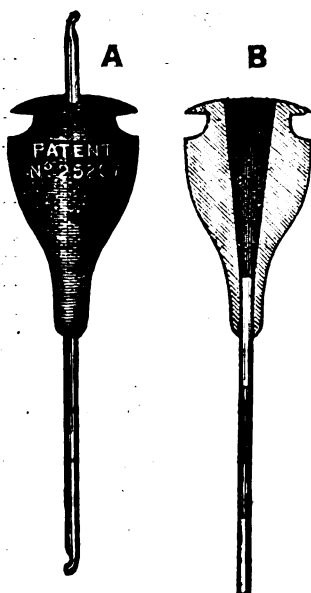
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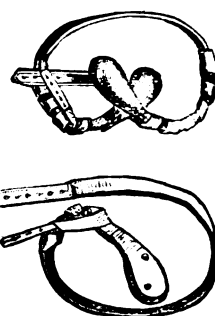
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Original Communications.

MALARIAL AND FILARIAL DISEASES IN BARBADOS, W.I.

By GEORGE C. Low, M.A., M.B., C.M.(Edin.)
Craggs Scholar, London School of Tropical Medicine.

THE analogy between malaria and filariasis is in many ways a close and interesting one, both, as far as the tropics are concerned, being very often found co-existing in the same districts, and both being spread from man to man by their own special species of mosquitoes.

It is, therefore, interesting to be able to point to a tropical island, namely Barbados, in which the former is non-existent, while the latter is extremely prevalent amongst all classes of the community.

The reason for the presence of the one and the absence of the other is supplied by the fact that *Anopheles* mosquitoes, the definitive host of the malarial parasite, are not found in the island, whereas *Culex fatigans*, one of the suitable intermediate hosts of *Filaria nocturna*, abounds (*Brit. Med. Jour.*, June 1, 1901).

Before considering certain local features of these two infections a brief description of the physical characters of the island may be given with advantage.

DESCRIPTION OF THE ISLAND OF BARBADOS.

Barbados, the most easterly of the Caribbean islands, lies well out in the ocean by itself in latitude 13° 4' north, and longitude 59° 37' west, about 100 miles distant from St. Lucia and St. Vincent. It measures 21 miles long by 11 miles broad, and comprises an area of 166 square miles, six-sevenths of which consists of a formation of coral limestone, the remaining one-seventh being formed of different geological strata, namely, the Scotland series, consisting of sandstones and dark clays, and the oceanic series, consisting of white earths and chalks. (*The*

Geology of Barbados, Harrison and Jukes Brown, 1890.) The surface is more or less flat, the land rising gradually towards the centre of the island into two ridges, one of which running east and west attains a height of 400 feet above sea level, while the other to the north of this is about 1,000 feet high.

The population of the island numbers 200,000, 30,000 living in Bridgetown the chief town, and 1,500 in Speightstown the second town, while the remainder are scattered about in separate huts and hamlets or in small villages.

With the exception of one or two springs, which bubble up and find their way into the sea within a few hundred yards of their origin, there are no rivers, the water supply for the town being obtained by boring into the large subterranean reservoirs of water which exist underneath the coral.

Several ponds and larger collections of water are found at different parts of the island, two such existing at Speightstown and Holetown respectively; three miles south of Bridgetown there is a permanent swamp.

In addition to these there is a creek communicating with the harbour, which runs inland for some distance in the centre of the town, and another swamp at the south of the island. The water in the latter disappears during the dry season. After heavy rains, and during the wet season, various collections of water are found in hollows and other situations, chiefly along the coast. The whole island is practically under cultivation, sugar cane being the staple product. Two seasons may be distinguished, a wet and a dry; the former in summer and autumn, the latter in winter and spring. The average rainfall is about 60 to 70 inches a year.

Malarial Fever.

On arriving in Barbados, and talking with the medical men practising in the town and island, they were unanimous in the statement that indigenous malarial fever does not exist in the island. Cases are frequently met with in the General Hospital; all of these come from some of the neighbouring islands

where malaria is very common. No one could point to a case which had originated in the island itself.

The interesting question now arises, are any mosquitoes of the genus *Anopheles* to be found in Barbados or not? As may be gathered from what has been already stated, the features of the Island do not lend themselves very readily to the production of suitable breeding places for these insects, with the exception of the swamp at Worthing, three miles south of Bridgetown. This swamp is situated at the foot of some elevated ground quite close to the sea, with which it communicates by a canal, the exit, however, being very often blocked up with sand thrown up by the surf. It covers a considerable area of ground and is divided up into canals and ponds with roads and paths running through it in various directions. The water, especially in the part near the outlet, is slightly brackish, and in parts it is very stagnant, smelling strongly of sulphuretted hydrogen resulting from the decomposition of vegetable material. It is probably fed by springs of water, rain, and other collections which percolate from the neighbouring high ground. The surface of the water at many places is covered with algæ of various sorts and other forms of aquatic vegetation. On looking at it, it certainly appears to be a spot favourable to the development of *Anopheles* larvæ, but although larvæ of a species of *Culex* and those of dragon flies and other aquatic insects were always found in abundance, no *Anopheles* larvæ could be discovered. Confirmatory evidence of this was found in the fact that the people living in the vicinity never suffered from fever, but enjoyed remarkably good health. It is probable, from the close similarity of this place to *Anopheles*-infested swamps in the other and neighbouring islands, that such larvæ could live here perfectly well; whether they have ever been here and have died out, or whether they have never existed, is a matter of speculation.

An examination of the other swamp at the south end of the island was not very hopeful, as at the time of my visit it had only filled up with water after some very heavy rain and contained practically no algæ or other vegetation; no *Anopheles* larvæ were found in it, the only result of my search being a species of *Culex* in small numbers. The creek in the centre of the town is very dirty and muddy, and is really an arm of the sea fed at its upper end by rain and other waters. Several examinations produced no larvæ of any sort, the water being probably too dirty for any thing to live in. All the various ponds, springs and other collections of water, though often containing plenty of suitable vegetation, gave similar results; in some larvæ of *Culex* were found, in others nothing.

These observations coincide with the researches of Mr. Lefroy, entomologist to the Imperial Department of Agriculture, who has also made a systematic search for *Anopheles* larvæ with negative result.

The conclusions reached, therefore, bear out that suggested by the epidemiological fact that there is no malarial fever in the island, and once more go to prove that without mosquitoes of the genus *Anopheles* no malarial fever can exist.

FILARIAL DISEASES.

In marked contrast to the absence of malaria is the large amount of filarial disease in Barbados.

This is not to be wondered at when one considers the extraordinary abundance of the common domestic mosquito of those parts, *Culex fatigans*, which acts as an efficient host for the spread of the disease. It is an interesting fact that out of more than 600 blood examinations of people from all parts of the island only *Filaria nocturna* was found, *Filaria demarquaii*, which exists in St. Vincent and St. Lucia, and which I lately found in Dominica, never being met with. Although Bridgetown has now a very good water supply brought in pipes from the centre of the island, where it is pumped up from the subterranean collections of water, yet many tanks exist in the gardens of the large houses for watering purposes, and around the native huts barrels and tubs of water are kept and left standing for considerable times. In these situations myriads of *Culex fatigans* breed and multiply and eventually may act as propagators of the disease. An examination of the night blood of 600 cases (taken irrespectively of the patients suffering from disease or not) from the General Hospital, Central Almshouse, and from private sources, will show to what extent filariasis prevails in Barbados.

Race.	No. Examined	Non-Infected	Infected	
Negroes	401	359	44	..
Mulattos	160	142	18	..
Whites	39	28	14	..
Total	600	529	76	= 12.66 %.

The proportion of fourteen infected whites out of thirty-nine is manifestly much too high to be regarded as representing the degree of infection in the white population as a whole. Many of these whites for one reason or another were collected in the almshouse at the time of examination, others being more or less selected private cases. The table indicates probably correctly the proportion of the coloured population affected. The figures referring to white people make clear a point on which sufficient emphasis has not been laid before, namely, that the white person is quite susceptible to filarial disease. This is specially so as regards Barbados, where persons, whether resident in the island all their lives or only visiting it temporarily, often contract the disease; the rich and poor are alike in this respect.

In analysing the table 27 or 4.5 per cent. of the total number examined, or 35.5 per cent. of the filarial cases, had definite pathological changes indicative of filarial disease, such as elephantiasis, chyluria, filarial lymphangitis, &c.; whereas 49 of the filarial cases, or 8.1 per cent. of the total examined, had no symptoms whatever, the diagnosis being come to by the discovery of embryos in the blood. This latter class is a dangerous one as regards the spread of the disease; for it is manifest that unless sleeping under mosquito nets, which if they are negroes they never do, they nightly infect many mosquitoes, which in turn infect other people and so spread the disease.

To get some idea of the number of infected mosquitoes about, a series of dissections of 100 mosquitoes of the species *Culex fatigans* taken from the wards and corridors of the General Hospital, in which there were cases with embryo circulating in their blood, was carried out. Of this number 23 per cent. were found to be infected with *Filaria nocturna* at various stages of development, and in one mature form were found in the proboscis, thus showing the danger of being near infected people.

The question arises, what can be done for the prevention of filarial disease? Much has now been done and tried for the destruction of *Anopheles*, the malaria-bearing mosquito. Similar or modified methods should be carried out for all domestic mosquitoes. Considering that their breeding places are confined to houses and their vicinity, this should not prove a task at all approaching in magnitude to the draining of large swamps or to treating them in other ways. Taking Barbados as an example, as has already been stated, there is now a perfect water supply, and people can get their water fresh from the stand pipes at their doors. Such being the case, old wells ought to be filled up, no water barrels or tubs should be allowed, or, if kept, they should be emptied every week or so. Tanks and collections of water in gardens should all be periodically treated with kerosene or be furnished with closely fitting covers to prevent mosquitoes getting in. These methods are simple and inexpensive, and each householder should see that they are applied in his garden and grounds. The difficulty begins when one has to take into account the inability of the negro to grasp anything of a hygienic nature. The only way to get over this would be a system of sanitary inspection by a few competent men. For individual prophylaxis mosquito nets ought always to be used, but many, even educated people, still persist in sleeping without them; of course nothing in this line can be expected of the native population.

If such means were adopted for Barbados, the prevalence of filarial disease, which is at present quite alarming, could easily, with little trouble and expense, be greatly diminished, thus saving much suffering, as well as loss of time, hideous deformity, and, doubtless, in not a few instances, loss of life.

THE PERCENTAGE RELATION OF EOSINO-PHILES TO OTHER LEUCOCYTES.

By EDWARD HORDER, F.R.C.S.Edin.
Pakhoi, South China.

ALL books, when stating the percentage relation of the various forms of leucocytes in the normal blood, give the eosinophile percentage at 2 to 4. It had been noticed for a long time, when examining the blood of patients, that there were certainly more eosinophiles than this number in the Chinese. With a view to ascertain the correct percentage of eosinophiles in their relation to other leucocytes, of the people residing in this part of the world, it was decided to examine, for some months, every patient residing in the General Hospital, besides a large number of lepers living in a separate compound.

Before beginning with the patients, the blood of

assistants, nurses, teachers, coolies, &c., was examined. These Chinese men and women were in perfect health, with skins quite free of any disease whatever. The average percentage of eosinophiles was 15, some of the men having 18 and 19 per cent. The Europeans were next examined, and gave an average of 5 per cent., two showing 6 and 8.5 per cent. respectively.

Among the general patients, including something of everything met with in the East, in not a few very high percentages were found. Patients suffering from ulcers showed an average of 20 per cent.; from measles 26, but this is generally recognised; from chronic rheumatism, anæmia, eye diseases, and ordinary diseases of metabolism, an average of 22 per cent. One case of tuberculosis, 42 per cent. Malarial patients showed an average of 12 per cent., two cases giving 37.4 and 24.5 respectively.

The average percentage of eosinophiles among the lepers is high, viz., 30. In many cases 42 per cent. was recorded.

Neutrophiles in nearly every patient gave a normal average, i.e., between 60 and 70 per cent, the lymphocytes showing an average slightly above what is considered normal.

It is well known that in skin diseases, asthma, and helminthiasis, high values of eosinophiles are obtained, and doubtless many, very many, of the Chinese suffer from these complaints; but after allowing for these, we have still a large number of people who are not suffering from such diseases, and as many more who are being treated for trifling complaints only, but still show a very high percentage of eosinophiles, the cause of which remains unexplained.

My object in sending this communication is to obtain from your readers the percentage relation of eosinophiles to other leucocytes in various parts of the world, that something like a correct percentage may be known regarding these cells.

It is quite certain the 2 to 4 per cent. for eosinophiles, stated in English, French and German books, does not hold good here.

THE CAUSATION OF BERI-BERI.

By MAX F. SIMON, M.D., C.M.G.

Late Principal Civil Medical Officer, Straits Settlements.

In a paper published in the JOURNAL OF TROPICAL MEDICINE for September, 1899, entitled "The Known and the Unknown in respect of Beri-beri," I endeavoured to show what had been done in endeavours to find out the cause of this disease, and what still remained undone, and I gave as my opinion that the best chance for the discovery of the cause lies in the domain of the pathological chemist, in the investigation of the chemistry of the blood.

Lately, Major Ross, F.R.S., of the Liverpool School of Tropical Medicine, has put forward a suggestion that, from the similarity of the symptoms of beri-beri to those of the neuritis caused by arsenical poisoning (as evidenced in the recent arsenical beer troubles), the possibility of poisoning by arsenic being the cause also of some of the cases of neuritis hitherto returned as beri-beri should not be overlooked. This sugges-

tion is worthy of attention, and I think that Major Ross would not object to its being considered to include poisoning by any other metal. I would point out, however, that in poisoning by arsenic, and perhaps by other metals, symptoms appear to occur pretty frequently, such as pigmentation and other affections of the skin, and affections of the eye, which, to the best of my knowledge—and I speak from an experience of thousands of cases—are never met with in beri-beri. Moreover, considering the different circumstances under which outbreaks of beri-beri occur, it is difficult to imagine how a metallic poison could be introduced in many cases, unless through either the water or the cooking pots. The water in many outbreaks can be put absolutely out of court, and as regards the cooking pots, were they in fault, not only would cases of acute arsenical poisoning occasionally occur, but beri-beri would probably be worse in any institution coincidently with the use of new pots, a relation which remains to be proved. In this connection I may mention that some months ago the Health Officer of, I think, Manchester, wrote to Singapore to enquire as to the possibility of beri-beri neuritis being caused by arsenic. There was an outbreak of beri-beri at the time in the gaol there, and Dr. Kerr, the Principal Civil Medical Officer, had every article of food that could by any possibility contain arsenic tested for that metal by the Government Analyst with absolutely negative results.

It falls to the lot of practitioners in the Straits Settlements, and probably other Eastern countries, to see many cases of undoubted alcoholic neuritis, in which a suspicion of arsenical alcohol cannot possibly be entertained, and these cases present symptoms clinically absolutely indistinguishable from those presented by patients suffering from beri-beri, and I would suggest that, if a chemical poison be the cause of the latter disease, this poison belongs more probably to organic than to inorganic chemistry. Such poison may be either a toxin, manufactured, as Manson suggests, by bacteria (possibly the famous diplococcus), under suitable circumstances of environment, either inside or outside the body (probably outside), or it may be analogous to a product of fermentation produced under certain conditions of preparation or serving of food, or in some other way not yet suggested.

I would therefore again propose the chemical as a possibly profitable direction for investigation to take, and would submit as points for consideration:—

- (1) Proof of infectivity of beri-beri blood serum.
- (2) A careful chemical analysis of beri-beri blood, especially of the serum thereof, and comparison with the blood of healthy persons.
- (3) Comparison of conditions prevailing among bodies of men among whom beri-beri does break out, with those prevailing in communities where (or when) beri-beri does not break out, in respect of:—

(a) Anything in environment pointing in the former case to opportunities for toxin formation which do not exist in the latter; (b) any differences in methods of cooking, time of serving out after cooking, materials used in cooking (pots, &c.) which might in the one case favour chemical changes in the food, but not in the other; (c) any other differences which may strike

an observer as capable of producing effects in direction indicated.

Dr. F. W. Mott and Professor Halliburton ("Croonian Lectures on Degeneration of the Neurone," *British Medical Journal*, June and July, 1900) have shown the presence of cholin in the blood of beri-beri patients, this cholin being a result of nerve degeneration; they have once obtained a toxic effect from beri-beri blood that could not be explained by cholin. Experiments which have been made in the Straits Settlements, not, however, yet in sufficient number, tend to show that the serum of beri-beri blood possesses toxic properties in the direction of causing neuritis. I am told by Dr. Mott that "the fluids injected by Professor Halliburton and himself were prepared from the blood of beri-beri cases after treatment with alcohol; the alcoholic extract was evaporated to dryness over a water bath, and the residue, containing cholin, dissolved in normal saline solution. Such a mode of procedure would in all probability destroy unstable and coagulable toxins, e.g., the products of bacterial growth."

It follows from the above that experiments in future should if possible be made with serum that is fresh, and that is taken early in the disease. The test for cholin is given in a footnote to the lectures referred to above.

HOURS OF THE DAY AT WHICH THE "RIGOR" OF FEVERS BEGINS.

BY EDWARD HORDER, L.R.C.P. AND F.R.C.S. EDIN.
Church Mission Hospital, Pakhoi, China.

THE following interesting clinical note has been forwarded by Dr. Horder. Of 388 observations made during the first six months of 1901, 46 per cent. of the fever cases developed rigors between midnight and midday, and 54 per cent. between midday and midnight. As Dr. Horder remarks in his letter: "The truth is doubtless that the larger percentage of cases begin between 10 and 12 a.m., although a fair number do commence between 1 and 6 p.m." All the observations were made in males.

TOTAL NUMBER OF FEVER CASES OBSERVED, 388.

Hours at which rigor commenced	A.M.										
	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12
Number of cases	5	3	6	6	1	0	3	2	8	9	135
Percentage	1.2	.7	1.5	1.5	.2	0	.7	.5	1.8	2.5	35.5

Hours at which rigor commenced	P.M.					
	1-3	3-5	5-7	7-9	9-11	11-12
Number of cases	81	71	48	7	1	1
Percentage	20.6	18.	12.5	1.8	.2	.2

WE are sorry that we omitted to mention that the blocks for the illustrations on p. 263, of our issue of August 1, 1901, were kindly lent to us by the editor of *West Africa*.

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THE

Journal of Tropical Medicine

SEPTEMBER 2, 1901.

HONG KONG.

THE REQUEST FOR IMPROVED SANITATION.

SINCE 1894, Hong Kong, except in 1895, has had a yearly recurrence of plague. The consequence is that the residents are alarmed, their lives are constantly endangered, sea-borne trade, their one means of livelihood, is hampered and at times paralysed, and there seems no guarantee that this, the seventh outbreak of the disease, is by any means the last. It is therefore not to be wondered at that they are bestirring themselves and writing letters to the public press and forwarding petitions to the home Government. The foremost men in the Colony have forwarded a petition to the Right Honble. the Secretary of State for the Colonies asking him:—

(1) To appoint a Commission consisting of a person or persons wholly unconnected with the Colony to proceed forthwith to Hong Kong to

investigate and report (a) on the sanitary condition of the Colony; (b) on the measures to be adopted for the improvement of the city of Victoria and of the Colony as it at presents exists.

(2) That you will be pleased to attach to the said Commission some independent sanitary expert to advise.

(3) That after receiving and considering the Report of such Commission, you will give directions for the recommendations of that Commission to be forthwith carried into effect.

The petitioners also ask that they may be granted municipal powers to manage the affairs of the city, instead of these being left in the hands of the Government of the Colony. This is a question which, however, touches a tender spot in even our very advanced Colonial Office. Anything but that seems to be the watch-word. The inhabitants may have popular representatives on the Legislative Council, on the Executive Council, or have a Sanitary Board, provided that in the two former the official votes outnumber the unofficials, and that the Sanitary Board has no power bestowed upon it. But that the residents should decide upon the cleansing and watering of the streets in which they live, or should be empowered to decide upon a system of drainage for the town, or water supply for their houses, are requests which are viewed askance by those in authority. A writer in the "British Empire Series," vol. i, p. 514, deals with the Sanitary Board of Hong Kong as follows:—

SANITATION.

"So as to perpetuate the burlesque of pretending to govern by popular methods, we find in Hong Kong a Sanitary Board. The concession to the Board of a majority of unofficials was rendered completely futile by withholding all executive power from the Board. It is merely a deliberate body, with power to recommend to the Council. So intolerable and repugnant has the position of the unofficial members become, that at the present moment the majority have tendered their resignation. This step is one which every right-minded person who retains a scrap of the sense of dignity due to his privileges as a British subject was compelled to take. The elector, trained in Britain to believe that he is entitled to a 'say' in the affairs of the Crown colony in which he takes up his residence, will be woefully disappointed. He must politically throw himself back to ante-Magna-Charta days; he must be content to lay aside all the freedom his forefathers

fought for, and submit to a *régime* of autocratic rule paralleled only by political life in Russia. Nay, more than this, he must expect to find himself made a burlesque of, inasmuch as he is given a vote which has no influence, and a voice in public matters which has all the machinery of Government against it and fit to render it abortive. A wise autocracy is perhaps the ideal form of government, but it is one British subjects have been trained to look at askance, and it is a little difficult to recur to a system which for well-nigh a thousand years has found no favour in Great Britain."

Hong Kong, from a sanitary point of view, deserves to be carefully studied, for here plague during the modern pandemic first reached a European settlement, and there it has remained for seven years. What is there in the city of Victoria or in the villages of the island of Hong Kong to thus attract and harbour plague? The water supply is excellent, the drainage is on the most approved "separate" or "dual" system. There is not only an ample Colonial medical staff practising in the hospitals, but there is a special Medical Officer of Health, a Sanitary Board, sanitary inspectors, &c. A veterinary surgeon sees to the condition of the imported cattle, the markets, the meat and milk supply, and the slaughter-houses. The city is, moreover, built on the steep side of a granite mountain, the rainfall is between 80 and 90 inches, and the fall towards the sea for the most part abrupt. What element in the sanitary armour therefore is deficient? We will take these seriatim. The *water* supplied to the Colony, although of good quality is deficient in quantity; well nigh every spring there is a shortage, and just as the hot weather sets in the water supply is cut down to sometimes quite a small quantity. This is serious in a city in a hot climate, and it is, circumstantially it may be, at this period of the year plague has invariably recurred. The *drainage* system of the Colony, laid down at a great cost, is perhaps not the one best suited to this particular city, or perhaps to any city in a tropical climate. The sewage is carried off in a nine-inch pipe, quite apart from the storm-water channels, so that the heavy rainfall benefits but indirectly the sewerage drains. The very fact of the city being built on so steep an incline also causes the contents of the sewers to be carried along at a great pace, leaving the pipe

empty and converted into a ventilating shaft for the sewer gases emanating below. Owing also to extension of the foreshore by reclamation from the sea, the lower ends of the drain pipes and channels, which end in the harbour, runs for perhaps 100 yards along the flat reclaimed part, where they are subject to the ebb and flow of the tide. Previously to the reclamation the drains terminated with a good fall right down to the sea-shore, but a long level stretch now necessitates a stay in the rapidity of the discharge, and the tide dams the lower end of the drains and forces the contents back and the gases upwards, so that twice in every twenty-four hours all parts of the city feel the effects. This condition of affairs favours the development of plague-bearing rats, so that the separate system of carrying off storm water and house drainage, although perhaps admirable for a city in temperate climates, would appear to be unsuitable to a tropical city. Yet how was this brought about? By the very means now being sought after by the petitioners.

In 1881-2 and 1889-1890 an expert, unconnected with the Colony, was brought out to Hong Kong, and his opinion on the sanitation taken. Few, very few of his recommendations were acted upon, in fact we know of but one, namely, the adoption of the "dual" system of drainage. His plan was opposed, almost virulently, by sanitary engineers, architects, medical men and by almost all the members of the British community who took any interest in sanitary affairs. Yet was the present system of drainage forced on the Colony, and the men in the service who favoured the scheme were promoted, and those who opposed it were neglected and set aside. So far, therefore, the excellence of the water supply, and the up-to-date system of drainage are myths, the former being insufficient and the latter altogether unsuitable.

Turning for a moment to the other equipments of Hong Kong. The Sanitary Board ought to be surely a useful body, for it is composed mainly of practical men, elected in some instances, and selected in others, to represent the residents; the unofficial members are, moreover, in a majority,

and it would appear that even in a Crown Colony an enlightened form of dealing with municipal affairs had dawned. No such thing; the Board, when it was created, was given deliberative powers only, a mere "talking" assembly, without executive power. The Board, by the Governor who called it into being was intended "only as a buffer between me and the public, so that the abuse meant for me may be directed on the heads of the members of the Board." The Sanitary Board, therefore, although figuring so well on paper, is functionally a powerless body. The Medical Officer of Health also is a Government servant and *under* the Principal Medical Officer of the Colony; there is therefore a distinct limitation to the scope of his powers. In fact, everything is concentrated in the hands of the Governor, and the smooth working and advancement of this Colony, as in other Crown Colonies, is totally dependent in the quality of man who is the governor for the moment. It is the system of Crown Colony government that the residents of Hong Kong are really petitioning against when the matter is sifted to the dregs; the sanitary question is the one which for the moment has surged to the surface.

There are other difficulties in stamping out plague from Hong Kong. There is the proximity of Hong Kong to Canton, and the mainland of China. Although an island, the traffic between Chinese and British territory is enormous and continuous. Hundreds of coolies travel by steamer daily between Canton and Hong Kong, and Canton we know to be a plague-infected centre. The extension of British territory also in the Kowloon district, situated on the mainland of China across the narrow strip of sea between the island and the mainland, renders isolation still more difficult, so that to all intents and purposes the island itself is part and parcel of the Chinese province of Kwang-tung. Hong Kong also has flourished so that property has risen in value enormously, *necessitating* overcrowding if the Chinese coolie is to obtain a livelihood at all, owing to lodging being expensive.

Were the petitioners to gain their point and obtain the control of their municipal affairs, were

an expert in sanitary matters to be sent to their assistance, and were all their other requests to be granted, many of the difficulties as regards stamping out plague in the island of Hong Kong would still remain; and it must not be imagined that by securing their ends a panacea would necessarily follow. The simplest way of dealing with the matter would seem to be, if municipal powers *cannot* be granted, to bestow upon the Sanitary Board executive powers—surely a just demand, for it is intolerable for earnest men to devote their time and attention to the welfare of the Colony by occupying seats at the Sanitary Board, where they are merely given place and opportunity so that they may serve as a buffer between the public and those upon whom the blame, if there is blame, should rightly fall.

Reprints.

THE SERO-THERAPEUTICS OF PLAGUE.

By JOHN BROWNLEE, M.A., M.D. GLAS., D.H.P. CAMB.

Physician Superintendent, City of Glasgow Fever and Smallpox Hospitals, Belvidere.

IN giving an account of my experience of the treatment of patients suffering from plague with Yersin's serum, as received from the Pasteur Institute of Paris, it may be well to point out that the disease as it occurred in Glasgow was apparently of a much milder type than is that usually seen in the East. The number of cases was too small to admit of statistical comparison between those treated with the serum and those not so treated, and on account of the mild character of the epidemic comparison with the statistics of other epidemics in other countries is not possible. Consequently the value of the treatment can only be gauged by a careful consideration of each case in detail.

The first two cases in which the serum was given were reported in the September (1900) issues of *The Lancet*. In both these cases the only organism obtained in puncturing the buboes was the bacillus pestis. The **first** of these cases belonged to the septicæmic variety of plague with multiple bubo. The prognosis was bad. Within thirty-six hours of the administration of the serum the temperature fell nearly to normal and the patient was apparently out of danger. In the **second** case, which appeared to be an example of the fulminant type of plague, an injection of 20 cubic centimetres of the serum intravenously, and of a like amount subcutaneously, was followed within twenty-four hours by a complete cessation of symptoms. Both patients were excessively ill, and in both the subsidence of the symptoms was marked and immediate. There were, it is true, some cases

of plague untreated by the serum in which there was a critical fall in the temperature, but in these the disappearance of the mental obscurations which accompanied the fever was much more gradual and the convalescence more tedious. In both the cases under consideration a symptom was present not observed in any of the other cases which ended by crisis—viz., a few hours after the injection a copious sweating occurred over the whole body.

The next three persons treated by serum suffered from a milder type of the disease; in only one was the prognosis doubtful. The first was a case with right inguinal bubo, from which on puncture a pure culture of bacillus pestis was obtained. The patient on admission did not seem sufficiently ill to require an injection of the serum, but two days later, as the symptoms had considerably advanced, 20 cubic centimetres were injected subcutaneously into the abdominal wall. The next day the symptoms had somewhat abated. The pain in the bubo was less and the reddening of the skin over the swelling was not so marked. In the evening, however, the patient's condition was again not so good, and by the following morning the temperature had again risen. The local condition had advanced and the infective process had extended so as to involve the lymphatic glands above Poupart's ligament and also the deep inguinal glands. A further injection of 20 cubic centimetres of the serum was then given, this time into one of the veins of the right arm. An immediate improvement was noted. Six hours after the administration of the serum the temperature had become normal, and on this occasion no subsequent rise took place such as had occurred after the former dose administered subcutaneously. In a second instance the result was equally interesting. This patient, a girl aged 14, suffered from a bubo in the left axilla. The point of entry of the infection was evidently located in the back, where, as described in the full report, a small pustule was situated which was proved bacteriologically to contain the plague bacillus. The external local condition afforded a visible index by which the therapeutic effect of the remedy could be gauged. Here again a subcutaneous injection of the serum was followed by a temporary improvement as regards the bubo, the pain being considerably less on the next day, but no improvement could be seen in the pustule above mentioned. A recrudescence of the disease occurred likewise in this case, with a rise of temperature to 102° F. A second pustule began to form on the back, while the erythematous zone surrounding the first occurring pustule became rather larger. Here again the intravenous injection of the serum in a dose of 20 cubic centimetres was followed by an immediate improvement. Within twenty-four hours a slough in the centre of the original pustule had separated and the inflammatory zone had almost disappeared, while the second commencing pustule had completely aborted. The patient, six hours after the administration of the last dose of serum, spontaneously expressed herself as feeling very much better. The temperature by the same time had fallen to normal and, as in the other case just mentioned, it remained so without subsequent rise. Convalescence from this point was rapid and uninterrupted. The third case belonging to this group

was the mother of the preceding one, aged 41 years. She had a right inguinal bubo. On admission the temperature was 102.4° F., the pulse was 104, and the respirations were 24. The patient was evidently ill, though a fatal issue was not expected. A subcutaneous injection of 20 cubic centimetres of the serum produced almost no effect, but there was, if anything, next day a lessening of the pain in the bubo. Thirty-six hours later a second injection of 20 cubic centimetres was given intravenously. As in the other two cases just noted there was observed an almost immediate improvement, the patient expressing herself as being much better six hours after the remedy had been administered. The temperature fell to normal within twenty-four hours and remained there.

The points to be noted with regard to all these cases are that **the subcutaneous injection of the remedy produced little effect**, and that of a temporary nature, while the **administration of the serum intravenously was followed in each case by an improvement** which was easily seen in the subsidence of the signs of illness, and which besides was spontaneously borne witness to by the patients themselves.

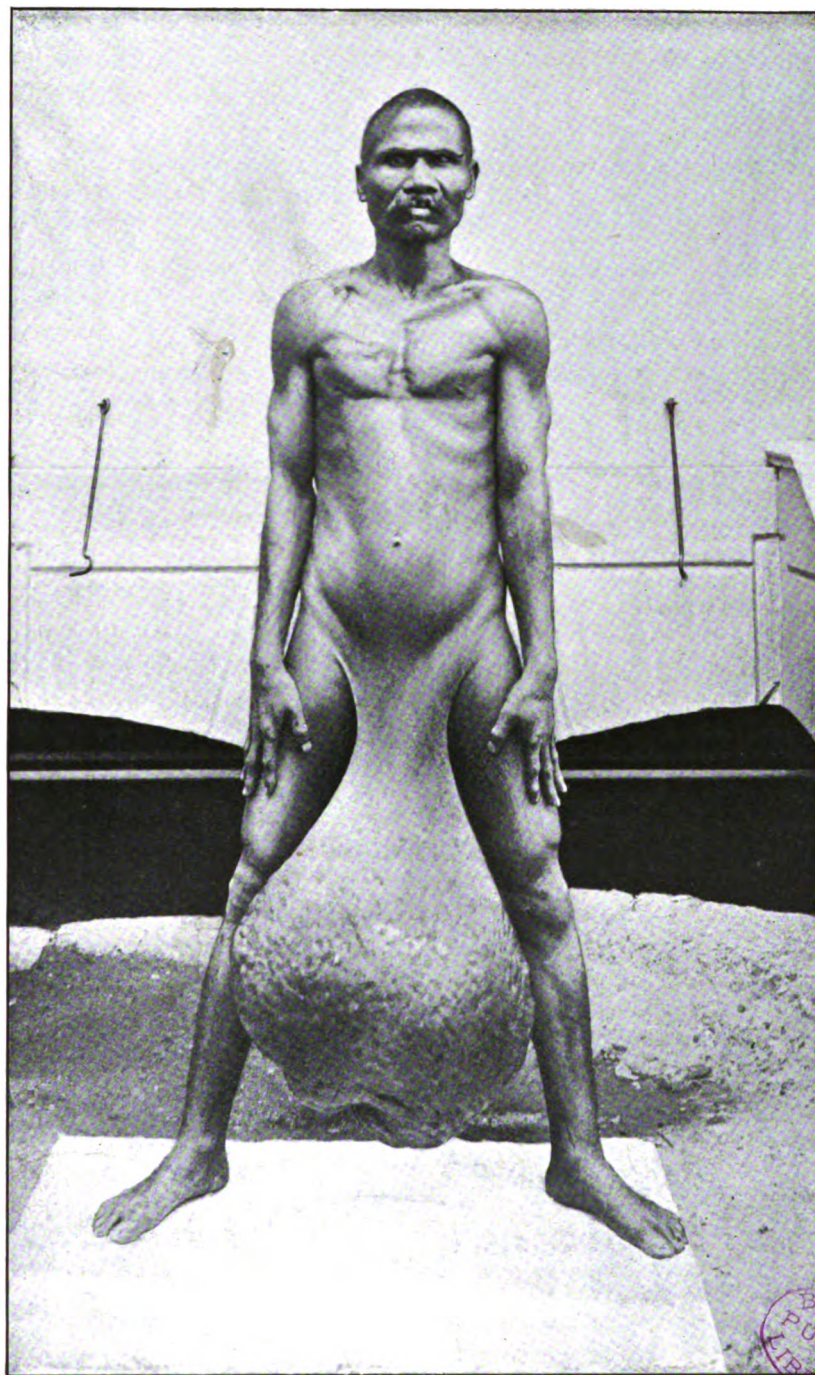
The serum was also administered to four persons in whom the disease progressed to a fatal issue.

A general review of the action of Yersin's serum falls to be considered under two heads—firstly, the prophylactic action; and secondly, the curative action.

(1) *The preventive action of the anti-plague serum.*—Of the healthy persons who had been in contact with plague and who received a prophylactic injection of the anti-plague serum two developed the disease. One of these was a maid attached to the service of the plague wards. From her buboes the specific bacillus of plague was recovered, and at the appropriate time after the disease was over her blood gave the typical agglutinative reaction in a marked degree. The other was the mother of one of the patients who died. During the course of the disease the pyrexia was fairly high, but she never gave the impression that she was dangerously ill. Three factors which might have contributed to produce this high temperature are suggested.

These two cases prove that a dose of 10 cubic centimetres of Yersin's serum administered subcutaneously does not afford complete protection, yet it is a fair presumption that a certain degree of immunity is afforded, as the symptoms in both cases were of great mildness. This corresponds with what has been frequently observed with regard to the action of diphtheria antitoxin when used as a prophylactic. Immunity is not a certainty, but if the disease becomes established the attack is almost certain to be slight.

(2) *Curative action.*—A general review of the facts given above and a consideration of the reports of the individual cases will, I think, justify the following conclusions: First, that subcutaneous injection of the serum is not of any great curative value. This is probably not due to the blocking of the lymphatics during an attack of plague, as has been suggested by some, in view of the fact that absorption of the serum by healthy persons is no more rapid than that seen in the plague patients. The failure in action is therefore much more likely the result of the lymphatic



ELEPHANTIASIS OF THE SCROTUM.

Photograph of a Malay, kindly supplied by Mr. GUSTAVE KUGELMANN, of Atchen, and forwarded by HENRY WALLACH, Esq., for publication, see page 297.

system exercising a distinct action as a biological filter on the serum, such as exists in other organs. In this way the antitoxic substances of the serum are retained largely in the glands which drain the area into which the injection is given, so that only the more inert portions of the serum reach the general circulation. It was noticed that the lymphatic glands connected with the area into which the injection was made in healthy persons enlarged for some days thereafter. This is not a proof that such a filtering action as above indicated takes place, yet it shows that some constituent of the serum having an irritant action is retained, and if the glands possess the power of filtering out certain ingredients of the serum, there is no reason to doubt, in the light of what has gone before, that this may include the active antitoxin. One case lends some clinical support to this view. The inguinal bubo, into the drainage area of which the serum had been injected, showed *post-mortem* evidence of a potent local effect in the marked degeneration of the bacilli, while the organisms found in other parts of the body were quite normal. It is therefore evident that subcutaneous injection of the serum can be efficient only in cases where the infection is localised to a bubo, and has not become general. Secondly, the intravenous injection of the serum seems, in most cases, to produce a most marked therapeutic effect, even when given late in the disease. In those cases, on the other hand, where double infection has existed from the beginning, its action is greatly lessened. In conclusion, it is probable that the doses given were in general too small, and should an opportunity again arise of using this remedy, large initial doses of 60 cubic centimetres and upwards would be given intravenously. Probably it would be advisable, if using the serum subcutaneously at all, to inject it only into the area drained by the lymphatic system which leads directly to the bubo.—*Abstract from "Lancet," Aug. 17, 1901.*

EXPERIMENTS WITH THE DANYSZ RAT BACILLUS.

By E. KLEIN, M.D., F.R.S.,

Lecturer on General Anatomy and Physiology at St. Bartholomew's Hospital.

AND

HERBERT WILLIAMS, M.D.LOND., D.P.H.CANTAB.,

Medical Officer of Health of the Port of London.

THAT the rat has been instrumental in spreading and communicating bubonic plague to the human subject is a statement which has been well established by past experience, and it has therefore become a matter of great importance to all medical officers of health, notably those connected with seaports, to find means by which rats in docks, harbours, sewers, warehouses, &c., could readily and quickly be destroyed on a large scale without any deleterious effects on other animals. As is well known, Danysz maintains that the bacillus which is known as the Danysz rat bacillus achieves this by giving to rats an acute, fatal septicæmic disease which, by ingestion of the bodies of infected and dead animals, rapidly spreads amongst them and consequently readily destroys them or

causes them to migrate from the locality. Experiments were instituted both in the laboratory and on a large scale in one of the warehouses of a dock in the Port of London in order to test this alleged destructiveness of the Danysz cultures and of animals dead after injection with such cultures.

The point to be determined was whether, as Danysz maintains, the culture of this bacillus is capable of causing death in a large percentage of rats fed on it. On this point the opinions of various observers differ; while, for instance, Kister and Köttgen, of Hamburg,¹ to a certain extent confirm Danysz's statement, others, like Krausz,² failed to confirm it.

(1) *Experiments in the laboratory.*—There is no difficulty in showing the high virulence of the Danysz bacillus for rats, mice, and guinea-pigs, if inoculated subcutaneously or intra-peritoneally, but it is different when the material is administered by ingestion. While it is a fact that virulent culture injected subcutaneously in a five-division dose into each of twenty-four mice caused death of all the animals in between twenty and forty-eight hours, when administered to other mice by ingestion in large doses it caused death of these animals in three, five, and eight days respectively. But the results were different with rats, for in these the feeding experiments with culture produced death in only 33 per cent. between eight and fourteen days. There appeared, however, to be a chance of causing death of a larger percentage of rats by feeding these on rodents dead of the disease after subcutaneous injection. Rats were fed on mice which had died in forty-eight hours after being subcutaneously injected with virulent culture. None of these rats became ill or died. A number of rats were fed on guinea-pigs which had died after inoculation with virulent culture, and here the percentage of dead rats was certainly increased. Of six rats fed with the material from the guinea-pigs (subcutaneous fluid, peritoneal fluid, and spleen) four died from the disease in eleven, twelve, eleven and eighteen days respectively; and of three rats fed with one whole guinea-pig two died from the disease in seven and eleven days respectively.

(2) *Experiments in the warehouse.*—The results of experiments of feeding on a large scale carried out in a dock warehouse in the Port of London, instituted by Dr. W. Collingridge, the late medical officer of health, and continued by the present medical officer of health are given in a tabular form. It ought to be stated in explanation that the sixty tubes of Danysz rat virus used between April 26 and May 31, were culture tubes (on agar) which had been directly obtained from the Pasteur Institute of Paris, and that the guinea-pigs, mice and rats used for the feeding experiments from June 14 to July 17, had all been inoculated subcutaneously in the laboratory with virulent culture of the Danysz bacillus, and immediately after death from the typical disease were laid on the floors of the warehouse. We would also draw attention to the fact that one rat which had died after subcutaneous injection of the typical disease was offered to the rats in the warehouse, but was not

¹ *Deutsche Medicinische Wochenschrift*, May 2, 1901, p. 275.

² *Ibid.*, May 30, 1901, p. 351.

touched by them, whereas all the mice and the majority of the guinea-pigs were readily eaten by the rats of the warehouse.

Unlike the laboratory experiments those carried out in the warehouse were wholly negative, and therefore, the expectation of the medical officers of health of a wholesale destruction of rats by Danysz rat bacillus, as a preventive measure against plague, cannot be considered from the results of the experiments to be of a promising nature.

It should be also stated that several rats that had not become ill after feeding with mice or with guinea-pigs or directly with culture, were afterwards subjected to subcutaneous inoculation with small doses of virulent culture. They promptly became ill and died with the typical disease, thus showing that the susceptibility of the rat to the disease by subcutaneous injection is incomparably higher than by feeding.

It should be further stated that all laboratory experiments on rats kept in captivity must be conducted with care, since these animals, according to our experience (confirming that of Krausz), are liable to succumb spontaneously. In our experience 25 per cent. of the animals die in captivity within the first week or ten days. On the other hand, those that remain alive and well after the first week or fortnight of captivity may be considered fit subjects for the experiment. It is possible that the great mortality of the laboratory rats observed by Kester and Kottgen may be due to this fact and not to their having been fed with the Danysz culture.—*Abstract from "Lancet," Aug. 17, 1901.*

HONG KONG. CLINICAL REPORT ON MALARIA, AS SEEN IN THE GOVERNMENT CIVIL HOSPITAL DURING THE HALF YEAR 1901.

By Dr. J. BELL,

Acting Principal Civil Medical Officer,

AND

Mr. G. STEWART (Lieut. I.M.S.)

Acting Assistant Superintendent.

THE authors state that they have been instructed by Captain Johnston, I.M.S.—a co-worker of Major Ross—in the technique of the examination of blood for malaria, the various forms of the disease and the deductions to be drawn from an examination of a blood slide. They determined this year to examine the blood of all patients with fever and as many as possible with symptoms suggestive of malaria, and the results of their observations are embodied in this report. They make no claim whatever to being authorities on malaria, but have simply recorded facts which have come under their notice clinically. They have dealt with over 400 cases, in the majority of which malaria has been present, if not at the first examination at a subsequent one, and it is possible these facts may be of interest to others.

Their report (abridged) reads as follows:

PHTHISIS.

The combination of malaria with this disease is very important as well as very interesting. Of seventeen cases examined fifteen were complicated with

malaria. Hong Kong and, we believe, most tropical countries are looked upon as being very prejudicial to the cure of tubercle. Amongst the Chinese here it is generally, and probably rightly so, to a certain extent, put down to overcrowding and insanitary surroundings, but this does not apply to Europeans and Indians who form the bulk of our patients and who suffer quite as much as the natives. We are inclined to think that the malarial combination accounts in a great measure for the rapidity with which the disease advances. Several of the cases have come in two or three times for fever without anything but malaria being found until eventually they have returned with another attack of malaria, the sputum previously negative now full of tubercle bacilli and the lung symptoms in full swing.

Unfortunately there is a reverse side to this picture, as in most of the cases after one or two attacks of malaria, the fever does not subside but takes on the hectic type and the case goes downhill. In this disease we think it is as well to examine for malaria, as we are inclined to think the combination much more prevalent than is generally supposed or even than our figures show. Another practical suggestion we would offer is that in all cases with fever and cough, however slight, though there are no lung symptoms, an examination of the sputum should be frequently made. We have by this means detected several cases in the very earliest stage, i.e., the stage when treatment or change holds out most hope. As a diversion we may add that all phthisical cases have been treated routinely with chinisol, but we have found that the drug has no effect on the disease, and after a long course the bacilli are still as numerous as ever. It has therefore been abandoned here and must, we think, be added to the long list of reputed specifics for this disease which have been found wanting. Carbolic acid in large doses has been substituted and the result will be duly recorded.

LIVER ABSCESS.

Only two cases have been under treatment and both showed malaria in the blood. It is laid down by the authorities that malaria does not produce sup-puration in the liver, but both our cases are against this view.

APPENDICITIS.

The combination of malaria with this disease is interesting. We have only had two cases and both showed malaria. One came in with malaria and later on complained of the appendix trouble. The usual operation was performed successfully.

DYSENTERY.

The combination of malaria with this disease is extremely common. Out of 37 cases examined 35 showed malarial parasites. None were fatal, though one or two were very obstinate and none were followed by hepatic abscess. Needless to say we found quinine most useful in addition to the saline and ipecacuanha treatment. We would almost say that, if a case of acute dysentery does not improve in forty-eight hours under the latter treatment, it is combined with malaria and requires quinine either by mouth or by enema.

TYPHOID FEVER.

The combination of malaria with this disease is most interesting to tropical practitioners. Without a *post-mortem* examination our diagnosis in some of these cases may be called in question, but they were all seen several times by other medical men who agreed with the diagnosis in every case, and if they were not typhoid it would be difficult to explain the long continued fever. Of the ten cases examined all showed malaria. The effect of the malaria on the chart was various. In some cases for several days the temperature intermitted regularly and markedly until, apparently, the malaria dropped out and the typhoid element had free play; in others, however, notwithstanding quinine, there was no intermission, and the chart from the beginning was very suggestive of typhoid. We have not found much assistance from Vidal's reaction, which in most of our cases has given a negative result—as late as the sixteenth and twentieth day in two fatal cases. Our only dictum on this subject is that held by most other practitioners—if after thorough treatment by quinine for ten days the temperature does not fall in the absence of any symptom to account for the continued rise, the case is in all probability typhoid and purgatives should be withheld. Typhoid is held to be a more fatal disease in the tropics than in temperate climates, but why this is so is not quite clear, unless the malarial element, which is present in the greater number of cases, has something to do with the high rate of mortality. The previous treatment of the malaria tends, we think, to keep the typhoid temperature lower than it would otherwise be. Our rate of mortality was 30 per cent.

PLAGUE.

Up to date eight cases have passed through the hospital, all being admitted as malaria and parasites being found in each case. It is very desirable to keep these cases out of a general hospital, as it entails such a lot of extra disinfection and there is always a risk—though small—of some of the other patients or the staff contracting the disease. We do not, however, see how this can always be managed. We were both on the alert throughout the plague epidemic and yet failed to detect some of these cases until they had been some time in hospital. We have not been very successful in finding the plague bacillus in the blood in these cases until the case was far advanced. Professor Kitasato states that it is rare to get them in the early stage, and if present there may be only one in a whole slide. Detecting it under these conditions must be due to good luck. The invention, by some bacteriologist, of a double stain, similar to Gabett's for tubercle bacilli—one of the most useful ever invented—would be a great boon.

RHEUMATISM.

Nine cases were examined, six being positive and three negative, one of the latter, if not two, being due to gonorrhœa. Acute rheumatism is said to be rare in this colony, and our experience bears out this view; but there is a great deal of what, for want of a better name, is called "rheumatism." Patients who have no swelling in the joints, and little or no fever, come to hospital complaining of nothing but pains in or

about the joints. It is, in these cases, extremely difficult to be sure one is not being imposed upon, as "pains all over" is a favourite way of getting a few days' rest, but we cannot help thinking that if more of these cases were examined it might turn out that some of them were really a form of malaria. If this disease produces inflammation of the nerves and their sheath one does not see why it should not equally affect the fibrous ending of muscles or joint ligaments, without giving rise to any objective signs much in the same manner as syphilis does. For obvious reasons, not many of these cases are admitted to hospital, so we have not been able to collect more cases.

JAUNDICE.

This is by no means a common sequelæ of malaria, though hepatitis is common enough. Four cases were examined and three showed malaria.

HEPATIC COLIC.

One case was under treatment and his blood showed mixed malarial infection. Under quinine and morphia he recovered without jaundice.

BERI-BERI.

We do not see very much of this disease owing to our limited accommodation. Five cases were examined and three showed malaria.

PNEUMONIA, PLEURISY AND BRONCHITIS.

Of these diseases thirteen were examined, and in nine malaria was present. None of the cases were fatal. It is a question as to whether a good deal of what used to be known as "influenza" in this colony was not malaria with a lung complication, the pains in the muscles, &c., being due to the malarial element.

ASTHMA.

It is an interesting fact that malaria has been recognised as a cause of this disease long before the parasitic days, though no one has yet attempted, as far as we know, to explain the pathology. The disease is not very common here. Seven cases were examined, and in six the malarial parasites were present. Hypodermics of quinine and morphia we found the best treatment.

NEURALGIA, &C.

Malaria has long been looked upon as a cause of inflammation of nerves or of effusion in their sheaths. These, not being exactly hospital cases, did not come much under observation, and we cannot say if this is a common form of malaria here. Two cases only of neuralgia were examined, one of which was positive. The negative one subsequently turned out to be due to syphilis. Two cases of sciatica were examined, both being of malarial origin. They were so obstinately recurring that both patients were invalided. Hypodermics of quinine in the line of the sciatic nerve is the best treatment, and it is just sufficiently painful to prevent malingering, for the disease, being one entirely of subjective symptoms, offers a fair field for a rest in hospital.

COLITIS.

Only one case of this disease came under treatment; malarial parasites were found in the blood. The patient recovered with quinine and saline purges.

DIABETES.

The only case of this kind which came under our notice was that of our Hindu cook and interpreter, an old Government servant of some twenty years' service and a subject of diabetes for over eight years. The disease seems to have absolutely no effect on him, although when in hospital with his malarial attack he was passing over four grains to the ounce.

ALCOHOLISM.

Only a few cases were examined, two of which were positive and one negative. We have not had many opportunities of investigating these cases for malaria, but we think there is little doubt that over-indulgence in alcohol, with the exposure which generally goes with these cases, helps to precipitate an attack of malaria in anyone who is already infected with the disease.

CHYLURIA.

This case was interesting as the fever was due to the malaria and not to the filaria. In a very few days, under quinine, the fever disappeared.

PURULENT MENINGITIS.

Only one case of this disease occurred.

A Chinaman from Manila was brought to hospital in a dying condition and without any history of his illness. The presence of malaria in his blood led to the belief it was a case of malarial coma. An examination after death showed extensive suppuration at the base of the brain extending up both sides and without any primary cause apparent either in kidneys, liver or elsewhere. Another case might here be mentioned which, by a curious coincidence, came under the notice of one of us (Dr. Bell) a few days after at the public mortuary. As no internal cause of death was evident the brain was examined and a precisely similar condition to the above was found. A smear from the spleen also showed recent malaria. Is it possible to get purulent meningitis as a result of wholesale blocking of the vessels of the brain or meninges by the malarial parasites?

PERNICIOUS ANEMIA AND MALARIAL CACHEXIA.

One case of each of these diseases came under notice, and both had the malarial parasite present in the blood. Both, I regret to say, ended fatally.

SYPHILIS.

Only four cases were examined, and three showed malaria.

ABSCESSSES.

Four cases were examined, and in all malaria was present.

INJURIES.

The shock of an injury, even when very slight, seems frequently to bring out an attack of malaria. Of nine cases examined five showed malaria.

GONORRHOEA.

Four cases of this common complaint had fever and their blood was examined. All showed malaria, and under quinine the fever rapidly subsided.

ERYSIPELAS.

Only two cases of this disease were met with. Malaria was found in each and both were very bad,

probably owing to the complication. They, however, did well.

MEASLES.

Two cases of this complaint were under treatment, one being complicated with malaria.

NEGATIVE RESULTS.

A few other cases with fever, slight or otherwise, were also examined, but gave negative results. They comprise cases of burns, dyspepsia, endocarditis, otitis, anæmia, and hepatitis. The shock of a burn should, we think, produce an attack of malaria, and further investigations on this head are required. We were only able to examine one case.

MALARIAL FEVER (UNCOMPLICATED).

Of these cases—perhaps the most interesting of the record—261 were under treatment during the past six months out of a total of 1,323 patients. There is, therefore, a fair amount of material available for the study of the disease in this hospital. Of this number 216 were of the malignant variety, which is here at any rate by far the most common form of the disease. Simple tertian fever occurred in 30 cases, and only one quartan came under observation. The latter variety would therefore seem to be extremely rare, which is perhaps fortunate, as it is stated to be very unamenable to quinine and tends more to produce anæmia than the other forms. Fourteen cases of mixed infection were also seen, but the combination of two forms of malaria in the same patient does not appear to make the case more serious or more obstinate. One policeman, who has been in three times, always has the mixed infection. In pondering over malaria, as viewed clinically, one cannot help being struck with the various forms of the disease, which are all due to the same cause. From the patient who either has no fever, or a fever which after a few hours disappears, leaving him well and able to get up, to the patient who is suddenly overwhelmed with coma, and in spite of all treatment passes away after only a day or two's illness, occur all shades of the disease, some yielding rapidly to treatment and causing no anxiety, others running their own course without, as far as one can see, any cause for the continued fever or for the difference between any two cases.

"Coma" malaria is very interesting. The five cases we had were all very serious and two ended fatally. Only one was in a Chinese, so that it would appear as if Europeans were more subject to this form.

MALARIA WITHOUT FEVER.

Two cases of this anomalous form occurred.

(1) Was admitted on January 24th with crescents and sporing quartan parasites in the blood. On 25th, quartan, 28th quartan and malignant tertian, and on the 31st crescents and malignant tertian were found. No rise of temperature throughout.

(2) Admitted January 30th, with malignant and simple tertian parasites *en masse*. Patient felt very seedy but had no fever. Under tonics and quinine he recovered.

In some few cases quinine did not seem to have much effect on the temperature, though why this was so was not clear.

CLASSIFICATION.

As there seems to be some difference amongst authorities as to the nomenclature of malarial parasites, we have adopted that suggested to us by Captain Johnston, which we believe is that used by Major Ross. It seems to us both simple and scientific:—

Simple Malarial.—Simple tertian and quartan.

Malignant Malaria.—(1) *M. tertian* (ring-shaped parasites with pigment). (2) *M. quotidian* (ditto without pigment).

To distinguish between the two forms of malignant malaria involves so many examinations of the same blood that we think it is sufficient to differentiate between the simple and malignant forms, which is what we now attempt to do.

TREATMENT.

Though we have nothing new to bring forward under this head, a clinical report would hardly be complete without a few words on the subject.

PROPHYLACTIC.

This hardly comes within the scope of a report of this kind, but we think we have shown that, until the day dawns when the mosquito will cease from troubling, a good deal more attention must be paid to endeavouring to prevent such conditions arising as precipitate a second attack of the malady. Briefly this consists in good and cheap food, good water, well ventilated and dry houses and avoidance of all excesses.

CLINICAL TREATMENT.

Our experience in this direction has been solely with quinine.

We tried what, we believe, is known as the foreign method, viz., a large dose either at the fall of the fever or at its height, and we gave 15, 20, and 30 grains, in some cases in the morning, and in others in the evening. As far as our fevers go this system is useless, or not nearly as effectual as the old way in vogue in this hospital to which we have returned. This consists in giving quinine in 5-grain doses every two, three or four hours, irrespective of the fever or the condition of the parasites as seen in the blood. We have no hesitation in saying that for this country this is the best method and gives the best results. The use of antipyretics (phenacetin, antipyrin, &c.) we have entirely given up as we think their employment depressing, and of course quite useless, as far as the destruction of the parasites go. In combination with the quinine we give a diaphoretic mixture (liq. ammon. acet. 4 drs. and pot. acetat. gr. xx.) every four hours whenever the temperature rises above 102° or 103°. This acts as a diuretic and diaphoretic, and is, at any rate, harmless, though personally we have a high opinion of it as tending to the comfort of the patient.

We may add that given in the above frequent doses we have seen no ill effects, nor have any of the patients complained of anything more than a temporary deafness.

We may also state that we tried in one case iron in large doses and quinine in small (tr. ferr. perchlor. ℥ xx., quinine gr. ii.) every three hours, as recom-

mended by a West Indian practitioner—and we certainly agree that it is worth a trial in those few cases which resist quinine.

Diet and the after use of tonics call for no remarks. Sir William Jenner's, dictum "feed your fevers," is as true of this fever as of any other.

LIVERPOOL MALARIA EXPEDITION.

MAJOR RONALD ROSS, F.R.S., according to a telegram in *The Times* of August 20th, is returning to England to organise an expedition to deal with the prevention of malaria by the destruction of mosquitoes, which is to be despatched to the Gold Coast and the Gambia. The sixth expedition sent out by the Liverpool School of Tropical Medicine is at present at Sierra Leone. The medical men engaged there at present are Dr. Logan Taylor, Dr. McKendrick and Dr. C. W. Daniels, the Superintendent of the London School of Tropical Medicine. The expedition about to be despatched to Gambia will be the seventh which the Liverpool School of Tropical Medicine has organised. As an example of the style of work performed by expeditions of this nature, the following statement by Major Ross is interesting:

"The work (says Major Ross) is proceeding very rapidly. We have twenty-four men, twelve of them supplied by the Governor, constantly engaged in draining away the *Anopheles* pools, and some of the most waterlogged and pestiferous streets have already, after only ten days' work, been drained. Another gang of seven men, with carts, is constantly engaged in destroying mosquito larvæ in private houses, and in carrying away tin cans, broken bottles, old buckets, &c., in which they breed. They clear about forty houses daily, and carry away about ten cartloads of old pots every day, of which about one-third formerly bred mosquitoes. I am reserving my full resources for cleaning the drying streams at the end of the rains. Labour is sufficient for the present. To-morrow I start by ss. *Jebba* for the Gold Coast, to arrange for similar campaign there. Dr. Logan Taylor remains here. Health of both perfect."

EXAMINATION PAPERS FOR THE CERTIFICATE OF THE LONDON SCHOOL OF TROPICAL MEDICINE.

SIXTH SESSION.

July 15, 1901.—10 a.m. to 1 p.m.

PAPER No. 1.

(1) Given a case of Quotidian Intermittent Fever in a patient from a malarial country, what are the points to be considered in making a diagnosis?

(2) Describe the clinical symptoms of Tropical Enteric Fever as regards their differences from Enteric Fever of cold climates.

(3) What are the chief clinical features of Nodular Leprosy and of Nerve Leprosy? also state how you would diagnose nodular leprosy from lupus, and nerve leprosy from leucoderma.

(4) In an outbreak of Cholera a number of tanks

are suspected. How would you ascertain which of these were infected with cholera micro-organisms? When ascertained, what precautions would you take to prevent the water from infected tanks being used?

(5) Describe a Pterygium, its mode of formation and treatment.

(6) Discuss the ætiology of Yellow Fever.

(7) Describe the most characteristic cultures of the Plague Bacillus.

(8) What are the pathological changes in the epidermis characteristic of Eczema and Psoriasis? Outline a scheme of treatment for a case of Acute Erythematous Eczema of the face.

July 15, 1901.—2 p.m. to 4 p.m.

PAPER NO. 2.

(1) Can immunity as regards the Malarial Parasite be acquired? If so, what evidence can be adduced for this conclusion? Give examples from comparative pathology of similar immunity in respect to protozoal diseases in the lower animals.

(2) State what you know of the conditions under which Pus is found in, or in the neighbourhood of, the Liver. What measures would you undertake for the relief of the patient?

(3) Describe the operation for Elephantiasis of the Scrotum.

(4) What do you mean by "Acclimatisation"?

(5) Describe, stating the diagnostic differences, the eggs of the Human Intestinal Parasites and the Filarial Embryos found in Human Blood.

PRACTICAL EXAMINATION.

July 16, 1901.—10 a.m. to 5 p.m.

(1) Stain and examine dried blood films A, B, and C, with special reference to any evidence of malaria. Note all abnormalities met with.

(2) Name twelve specimens under the microscope.

(3) Make dissections from three mosquitoes to show the stomach and salivary glands in a condition suitable for examination for Malarial Parasites.

(4) Examine the specimen of fæces, D, for ova of entozoa. State what you find.

(5) Examine broth culture E with a view to a tentative diagnosis. What further steps would you take to confirm your diagnosis?

(6) Examine and report on a case in the wards. Give your diagnosis, prognosis, and treatment of the case.

(7) What do the six cultures in the rack demonstrate? What conclusions would you draw as to the nature of the organisms?

A, Benign Tertian Parasites.

B, Pernicious Anæmia.

C, Mixed Infectious Malaria, Quartan, and Crescents.

D, Fæces contain ova of *Anchylostoma*, *Tricocephalus*, and *Lumbricus*.

E, Broth Culture, *Bacillus Phleri* (Timothy Grass).

Biciclos.

PRECAUTIONS AND SUGGESTIONS FOR THE PREVENTION AND CHECK OF CHOLERA, based chiefly on Professor Hankin's book, "Cholera in Indian Cantonnments." By Colonel Joshua Duke, I.M.S. Officer, P.M.O., P.F.F.

This pamphlet of six pages is a veritable mine of gold as regards the prevention of cholera in cantonnments, and the thanks of India are due to the author for the trouble he has taken in compiling it. Times are indeed changed in that country as regards the means of meeting the disease; with a more scientific view of its etiology, we can now hope to prevent its ravages. That old fetish, "the climate and other cause" theory has, we trust, been finally pulverised, and will never raise its dishonoured head again. Colonel Duke begins by relating in clear language how to deal with the cholera microbe—the *fons et origo mali*. It can with the greatest ease be destroyed by antiseptics or long exposure to sunlight, boiling, or drying.

In waters aerated by carbonic acid, it cannot live. Hence soldiers should be encouraged to drink aerated waters in cholera times.

The treatment of cook-houses, wells, mussacks, earthen vessels and drinking vessels, is minutely described; more especially useful will be found the directions to be employed in mess and other cook houses.

This little work—a treatise in a nutshell—should be in the hands of every medical officer in India. We congratulate Colonel Duke on the care he has taken in its production. The directions, if followed out, will without doubt be the means of saving many lives.

News and Notes.

PLAGUE AND CHOLERA.—During the year 1900, plague caused 38,412 deaths in India. The death rate from cholera during 1900 was, however, higher than in any previous year of which we have reliable records; the actual deaths from cholera during the year numbering 345,871. Yet we heard but little of cholera and its ravages at the time, although cholera deaths in proportion to plague deaths were almost nine to one.

RATS ON SHIPS AND PLAGUE.—Allowing that rats are the plague distributors we assume them to be, it is surely time that the rats on board ships were dealt with systematically. It is impossible to exterminate rats on a ship full of cargo, but in an empty vessel the process of extermination is neither very expensive nor difficult. There is always danger of rats reaching the ship from the quay along gangways, chains, ropes, &c., or being carried on board with cargo. When, moreover, plague is known to prevail in a port of call, the vessel should not be placed alongside the quay, but at some little distance from the shore, so that rats have less opportunity of reaching the ship.

In the same way, no vessel from an infected port should be permitted to draw up alongside a wharf, but should anchor in the stream.

be of sufficient interest to the readers of the JOURNAL OF TROPICAL MEDICINE, I place the material at your disposal.
I am, dear Sir,

Yours, &c.,

Cambridge Street,
Hyde Park, London.

HENRY WALLACH.

RESULTS OF CONSUMING FRUITS AND VEGETABLES AT THE SAME MEAL.—IN the *Gazette des Hôpitaux*, Dr. Baroux broaches a subject which opens up a wide field for investigation, and from which useful lessons in dietetics may possibly ensue. When vegetables containing oxalate of potash, such as spinach or tomatoes, are eaten at a meal and followed by sour cherries, or an orange, &c., the citric acid in the fruit is sufficiently potent to set free oxalic acid from the oxalate of potash in the vegetables; the free oxalic acid is calculated to injure the mucous membrane of the stomach, with the result that discomfort or pain may ensue in the epigastric region, even vomiting or colicky pains may result, and other symptoms indicative of slight poisoning.

These examples might be multiplied. Thus, tomato soup followed by pheasant sprinkled with lemon juice contains salts which are chemically insalubrious articles of diet. The matter is well worth looking more deeply into. In this direction may be explained how an apple is believed to be, and not only believed to be but is, more easily digested before noon than after. Is it because vegetables do not form part of an English breakfast? It is doubtful, however, if the malic acid in apples is sufficiently potent to set free any vegetable acid from its alkaline base, yet it is a fact that apples and other fruits are less digestible during the afternoon and evening than in the morning, and it may be that the previous ingestion of or abstinence from vegetables may determine the digestibility. Acetic acid, according to Dr. Baroux, does not decompose the oxalates, so that we may still continue to take vinegar with our tomatoes and salads. It is suggestive, however, of damage from free oxalic acid when vinegar is used, that oil and often an egg are almost invariably taken with it in salads, the antidotes as it were, or rather the agents administered when corrosives of any kind gain entrance to the stomach. The oil is stated to be taken to prevent indigestion from the eating of salad; this may be so, and it may be that it is by counteracting the oxalic acid set free that the indigestion is thwarted.

Correspondence.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIR,—I beg to hand you the photograph of a case which might interest you very much. The photograph represents a rather extraordinary case of "Elephantiasis Scroti." The victim, a Malay, has been, I am told, successfully operated upon in the hospital at Kotaradja, Atchen, or as the Dutch prefer to call it, Atjeh. The swelling, which had the enormous weight of 33 kilograms, extended so far down the legs, as the photograph shows, that the poor man had to stand, and to propel himself was obliged to keep his legs spread out, and no doubt his sufferings were enormous. The photograph has been received by me through my friend Mr. Gustave Kugelmann, who has been residing in Atchen for twenty-five years. If you think this short note would

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Current Literature.

THE CHIGOE IN AFRICA.

AT one of our recent demonstrations some specimens of the cyst-like formations caused by the "Jigger flea" were shown. They were from Pemba (Zanzibar), and had been brought over by a lady missionary (Miss Emily Hutchinson), who had trained herself to expertness in their extraction. They look like little fibrous bags about as big as peas, and are placed immediately under a layer of epidermis. Their extraction is to be effected much in the same way that the buttons of molluscum contagiosum are removed. The epidermis must be freely cut through all round the circumference of the little cyst, and the latter must then be most carefully taken out. It is very important to remove it whole, as if any part is left, a troublesome sore may result. The cyst consists of the female—probably dead—and her eggs, and if any of the latter are left to hatch, much pain and disability will ensue. Our informant stated that the disease is now very common in Pemba, and that a not unimportant part of mission work consists in teaching the natives how to deal with it. The occasion elicited from Sir William Kynsey the information that the Jigger is not as yet known in Ceylon. It is a curious fact in the natural history of this insect, that it is believed to be of recent importation into Africa—its native home being South America. In Africa, however, it has spread so rapidly that it has become a very serious plague. Sir Henry Colville, in a recent article on Uganda, speaks of it "as perhaps the greatest curse of the country, though (if care be taken) a minor one"; and adds that "it has maimed whole populations." After saying that a man tried before him for the murder of his wife admitted the fact, but alleged in excuse that she was terribly infested with Jiggers, he concludes his statements by a doleful foreboding:—"I have no wish to be a prophet of evil, but it seems to me very probable that the

Jigger will be the curse of Africa. Having made his way half across the continent, I can see no reason why he should not overrun the whole of it, unless science can find some means of stopping his progress."

At the time when Sir Henry wrote the Chigoe had reached Uganda, which, as a glance at the map (see Unyoro, lat. 1° N.) will show, is almost in the middle of the continent. Since then, as our specimens prove, the flea has fulfilled his prophecy, and reached the east coast.

Since writing the above, we have been favoured by Dr. Moffat (a grandson of the missionary) with the following particulars as to the Jigger in Uganda. Dr. Moffat had resided in that country as principal medical officer for some years. The Jigger had, he said, not been known until recent years. It had travelled across the continent from West to East, and Emin Pasha's expedition was credited with having completed its line of communication. Dr. Moffat told us that he had known many instances in which digits had been lost by the inflammation caused, and in some instances even an entire foot. It is not by any means confined to the human skin, but may live, and probably breed, in sand and in floors of houses. In such situations it often exists in countless numbers. It multiplies with marvellous rapidity and travels fast. It exactly resembles a small flea, and can jump like one. In penetrating the skin it causes no pain or irritation, but a few hours after it has embedded itself, intolerable itching attended by burning pain is caused. Dr. Moffat is of opinion that in Uganda the Jiggers are becoming already less virulent in their effects than they were when first introduced. He did not know of any remedy by which they might be killed, and held that prompt extraction was the only measure. Various substances might be used to smear the hands and feet to prevent its attacks.

As yet the Jigger has not reached Madagascar or India, nor, we believe, Arabia. It is, however, much to be feared that we shall soon hear of it in all these places. Since its chief means of transit is in the human skin or clothing, we have another instance of the dangers, as regards the propagation of disease, which modern facilities for locomotion entail. Although, after all, only a flea, its effects are, as we have stated above, sufficiently serious to make the study of the means for its exclusion well worthy the careful attention of medical observers.—*Polyclinic*, August, 1901.

MALARIA.

PROPHYLAXIS AS RELATED TO MILITARY HYGIENE.—G. Delogu, in the *Gazzetta degli Ospedali e delle Cliniche*, June 9th, 1901, recommends that when malaria occurs amongst soldiers in camp the patients ought to be isolated and protected against mosquitoes. On the march long gloves to cover the hands and wrists, and horsehair masks over the face and neck should be worn to protect the soldiers from the anopheles. Barracks, tents and latrines should be screened, and especially at nights should tents be closed and the beds provided with mosquito nets. Manœuvres should be held not later than the middle of May, i.e., before mosquitoes abound.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Esercito
Hongkong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
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2.—Manuscripts sent in cannot be returned.

3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

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Original Communications.

ON UNDESCRIBED HÆMATOZOA OF MALARIA IN THE MALAY PENINSULA; AND ON BLOOD-PLATES AS TRUE HÆMATOBLASTS.

By W. LEONARD BRADDON, F.R.C.S.
State Surgeon, Negri Sembilan.

PART I.

In the Malay Peninsula probably all the hæmæmæ known in man occur. I have not met with the quartan, but have identified the large simple tertian, the small pigmented, "malignant" or "tropical" tertian, and the small unpigmented quotidian forms, none of which there is any difficulty in demonstrating, whether in the fresh blood or by staining fixed specimens.

But by far the most frequent hæmatozoon met with presents appearances which are shared by none of these, and to which none of the published descriptions of any of the known blood-parasites bear indeed any resemblance.

The appearance of this parasite, as commonly seen at intermediate stages of its growth, is that of a delicate, irregularly branched and knotted net-work of filaments spread throughout the corpuscle. The aspect of a disc so infected when stained with methylene blue is that of a substance through which the mycelium of some fungus ramifies. When decolourised the absolutely white discs, upon which the sharply cut but irregular and extraordinarily fine filaments of the parasite appear in sharp relief, afford a picture which may be compared to the shadow-contoured face of the full moon, to marble, or, to employ a more homely simile, to a blue-veined cheese; or the innumerable knotted slender and irregular branches of the parasite may be perhaps more aptly compared to seaweed. There never appears to be any more solid gelatinous or amœba-like portion, and no part of the parasite ever presents the rounded

appearance characteristic of forms hitherto described.

At first sight the net-work appears immobile. Even on careful inspection movement is not obvious, and, if apparent, apt to be ascribed to alterations of focus, or change in the corpuscles' position. The branches are, however, in constant motion; a rapid undulatory motion seems to pervade every part of every filament, so that portions of the network approach and recede out of focus, and bend and stretch, moving continually throughout the corpuscles, so that from movement to movement the picture becomes entirely changed. The actual motion of any particular part is not easy to follow, yet occurs so quickly that conviction of its actuality only dawns upon the observer as a result of noting the changed aspect of the whole. This feature makes the comparison to seaweed still more apt, nothing more resembling the movement of these filaments than the irregular changes in form of a mass of *fucus* swaying in disturbed waters.

As a short name where a distinctive one seems necessary, and as to some degree descriptive, I have called these parasites "*mycoid*."

In the earliest stages which I have noticed the parasite appears as a small deep-staining particle upon or within the very periphery of the red disc. This speedily grows, branching irregularly until the most advanced forms fill the whole of the corpuscle with a dotted ramification of interlaced filaments. Owing to the delicacy of the filaments and their constant motion, it is difficult to ascertain their more intimate structure. They are of course *cyanophil*, to use the word which Simon¹, following Laveran, considers preferable to *chromatophil*, but whether composed of true chromatin (or karyoplasmic substance) I have not determined. The dotted nodes or knots appear to be at the points of branching; and although this again is not easy to settle, in the maturer forms at least they would seem to be finely

¹ *Annales de l'Institut Pasteur*, May 25, 1901, p. 322.

pigmented. Quantities of pigment are to be observed in the leucocytes and the plasma in these cases, but in the parasite as observed in the living blood, the deep-staining precludes any certainty of observation; but it seems certain that coarse granules, such as characterise the known tertians, do not occur.

Of the further extra-corpuscular stages of this hæmatozoon I can at present give no particulars. But at all times during the course of an infection some, and after the fastigium of the febrile attack great numbers, are to be observed free in the plasma. They appear varying in size from small irregularly shaped short branched threads or rods, often resembling cocci, diplococci, or bacilli, undergoing some unusual involution, up to spread-out branching masses many times too large to find room in a single corpuscle. It is from single corpuscles, however, in which their growth has been so great as to cause their rupture, that these masses are probably shed. In the plasma they exhibit a mode and degree of motility similar to that which they do within the disc. It was probably these bodies, which closely agree with their description, that formed the flora found in the blood of beri-beries by Pekelharing and Winkler.

After the fastigium there are to be found in the blood of many cases, in great numbers, bodies, between which and the *gametes* of other hæmatozoa some resemblance may be traced. I have figured several forms of these bodies, one of which would appear to be flagellating, but at present I am not in a position to affirm anything more concerning them.

It may be added that it is not usual to find all the examples of the sea-weed parasites at the same stage of growth at one time. On the contrary, every degree of size and maturity are generally to be seen simultaneously. In many specimens they are so numerous that nearly every corpuscle has appeared to be infected.

Of the clinical relations of the parasite to the fever which it causes, I need only say here that the severity of the latter, and especially the resultant anæmia, have seemed to be in direct proportion to the numerical extent of the invasion. I have been unable to detect in the course of the disease any periodicity other than quotidian. The paroxysms come on as do those of other malarial fevers, usually in the forenoon, and last about the same time. There is no sharp crisis and rarely marked division into the three classical stages. The general symptoms and course of each attack otherwise closely resemble the other malarial fevers, and like them are amenable to quinine. The disease, as a whole, has seemed to be one of a single infection, the effects of which, unless cut short by treatment, endure normally, and on an average about six days. There then follows an interval of about a week free of symptom, to be succeeded by a second attack similar to but milder than the first.

There then appears to be established what has been termed "immunity," but should more properly be called *toleration*, for a long period of time. The presence of this parasite in the blood in scanty numbers often coincides with slight attacks described as "liver," and other mild indispositions unaccompanied by fevers and usually cured at once by quinine.

As regards the frequency of occurrence of this as compared with other parasites, I give an analysis of the last 163 cases of severe fever which have been treated in the Seremban General Hospital, in which the form of infection has been carefully noted.

FORM OF PARASITE.	No. of cases.
<i>Single Infections.</i>	
Small unpigmented (malignant quotidian) ring and other forms only	6
Small pigmented ring and other (malignant tertian) forms with crescents only	5
Small and large unpigmented "mycoid" forms	98
<i>Mixed Infections.</i>	
Small pigmented (malignant tertian) and "mycoid" forms	33
Large pigmented (simple tertian) and "mycoid"	21
	163

Of many of the cases the responsibility for the diagnosis rests with my assistant, Mr. J. V. Schelkis, who is, however, a careful observer, but the record may be taken as showing pretty correctly the great preponderance of the "mycoid" infections over the others. In 152 cases out of 163 this form was certainly present, and in 98 was present alone.

Upon the clinical aspect of this fever and its therapeutics I hope to be able to offer more extended observations in a future paper.

The *technique* required to demonstrate the parasite, and employed also for the observations described in the second part of this paper, may be noted here.

By none of the fixing and staining methods usually employed for the described hæmatozoa have I been able to demonstrate successfully the "mycoid" form. This is best shown by the method of "vital staining," practised as follows: The finger is first pricked, then wiped; on the spot is placed a drop of staining solution (distilled water containing potass. cit., 1 per cent., methylene blue $\frac{1}{2}$ to 2 per cent.), into which the drop of blood is squeezed. This is then allowed to flow by capillary attraction between a sterilised slip and slide already prepared. A small portion only of the drop is allowed to enter, so that it spreads out into a very thin layer. The edges of the slip are then sealed with vaseline.

In such a preparation the discs will for the most part preserve their form for at least forty-eight hours and can be examined at leisure.

This process is not only the best but the easiest and most rapid method of obtaining a blood film under all the conditions required for careful examination, and above all, for immediate diagnosis. For within five minutes and earlier, if stronger solutions of blue be employed, the leucocytes and all intra-corpuscular nuclei and hæmatozoa become stained and conspicuous.¹

I cannot too strongly recommend this process to all

¹ When I brought this method to notice in an earlier number (Vol. iii., p. 110) of this Journal, I was not aware that it had been used by others. But Hayem describes it in his treatise *du Sang* as employed by himself long ago, and recommends it also as the best way of observing corpuscles without exposing them to exposure or pressure (*Hayem, du Sang*, 1882, p. 85). Hayem's method did not include the solution which I use, however.

who wish to frequently and rapidly submit the blood to examination for parasites. As will be seen from the illustrations given, all forms of parasite stain equally well, while the absorption of the blue by them does not apparently in any way interfere with their activity. Indeed I have observed in the sporing forms of malignant tertian the pigment dancing continue for three days after exposure to the stain. In this case the spores were obtained from the cancellous tissue of the bone and spleen twenty-four hours after.

The stronger the proportion of blue the more rapidly does the stain act. Stronger solutions cause expulsion of the hæmoglobin from the corpuscles, which is rather an advantage than otherwise, as they still retain their form perfectly while the endoglobular parasites retain their place and appear in no wise injured.

In such clear discs the "mycoid" parasites are exhibited in great beauty and continue their movements, so long as the corpuscle resists disintegration, which it may do for as long as three days. The parasites frequently appear in the plasma in all shapes and sizes after the blood is thus healed, some of them no doubt derived from the breaking up of corpuscles, but others, chiefly smaller forms, are seen in great numbers, and under conditions of control which leave no doubt that they are really naturally free in the plasma.

As mentioned above, I have found no really good way of obtaining permanent stained preparations of this parasite, though the following method is fairly successful. A large drop of blood prepared as described is placed on slide or cover slip and left as a hanging drop, in a small chamber provided with moisture. Simple methods of effecting this are, either to place the cover-slip on a ring already fixed, in the space at the bottom of which is some water, the upper edge of the ring being vaselined; or to cut a disc out of a slip of wetted blotting paper. Place the latter so as to lie on the slide and surround the drop, and thereon to put the ring, which is then covered with more wet blotting paper, upon which is placed another slide, for pressure. After ten minutes the drop is made to flow slowly over the slide in a thin layer, which is then allowed to dry and may be examined. The specimen is best mounted dry, fixation by heat or alcohol spoils the specimens.

In blood films, fixed and stained by ordinary methods, it is seldom that the parasite is to be seen satisfactorily. As a rule, owing apparently to the retraction of its fine filaments only, a shapeless mass of irregular contour is to be seen, which stains not nearly so well as do other described parasites. Want of sustained leisure, as well as of experience, has prevented me from elaborating any better technique for permanent preparations.

It is to be added that the "mycoid," or sea-weed parasite is practically undistinguishable in fresh, or dried, unstained films. Even in specimens in which I knew them to be present in nearly every corpuscle I have found the greatest difficulty in determining their presence without a stain. It may be owing to this and to the fact that the examination of dried, fixed and stained specimens has all the vogue that the

form which I have described has not been recognised earlier.

As my paper is headed *Hæmatozoa*, I may record here a single observation of a vermicular form, resembling that which Dr. Simon has described from a tortoise as *Hæmogregarina Mesnili*.¹ This parasite was seen in several corpuscles in one case only, of which I subsequently lost sight. As drawn at the time its measurements were 1 to 1½ μ , by about 12 μ , and its movements within the disc were extremely active, resembling coiling and uncoiling in loops and figures of eight very rapidly. It was observed unstained and showed no pigment. I have once observed also in the blood of a Tamil, groups of what were apparently segment products or merozoites of some gregarine resembling those noted by Captain Cornwall,² but larger.

THE ANTI-MALARIAL CAMPAIGN IN WEST AFRICA.

By A. H. HANLEY, F.R.C.S.I., &c.

D.M.O., Southern Nigeria.

WHILST in Edinburgh last week I read in the *Scotsman* of September 6th, a letter from Major Ross to Mr. Alfred Jones. Without in any way questioning the admirable work Major Ross has done and is doing in West Africa, I must take exception to at least one part of his letter. He states that the unhealthiness of the climate has been exaggerated. Government, as well as the traders' returns hardly bear out this statement. My personal opinion, after sixteen years experience of West Africa, during ten of which I have not been from sickness a day off duty, and therefore am in no way prejudiced, is that the unhealthiness is in no way exaggerated. A physical and mental deterioration takes place in a large percentage of the European residents, such deterioration being more marked in some than in others. This deterioration presents itself in the form of anæmia, muscular weakness, nervous exhaustion; or you get so enervated that it is with difficulty you perform your daily work. Microscopic examination of the blood of people in this state invariably gives a negative result as far as the plasmodium malariae is concerned. I believe that if in addition to improved sanitation and destruction of *Anopheles* we could improve our present diet of lean goat, fowls, and tinned or locally grown vegetables, there would be better health.

This has frequently been brought home to me by observing men who are unable to partake of our ordinary diet are at once tempted by the English meat and vegetables we occasionally get from a steamer. A system of ice boxes from home might be easily arranged for if our steamers had larger refrigerators. I am frequently asked what is a person to do in order to keep good health on the coast? and my invariable reply is take plenty of exercise, quinine twice a week, and do not allow your bowels to become constipated. I have for years advised the use of a mosquito curtain

¹ *Annales de l'Institut Pasteur*, May 25, 1901.

² *Indian Medical Gazette*, April, 1901.

at night. Before Major Ross made his great discovery I was under the impression that the curtain merely acted as a filter for the moist-laden atmosphere. That the *Anopheles* are the cause of a great deal of ill-health in West Africa is now beyond doubt, and I believe future investigations will bring to light other causes besides the *Anopheles* to account for the high mortality and invaliding that at presents exists. I have been greatly struck by the scarcity of malaria-infected *Anopheles* as compared with the number of malaria-infected children. Out of 145 *Anopheles* caught in the vicinity of a native town in which 80 per cent. of the children whose blood was examined contained malaria I was only able to find one infected. *Anopheles* caught in the room of a European down with fever invariably gave negative results. I may, in conclusion, add that I consider that the greatest credit is due to the members of the various scientific expeditions who have volunteered to go to West Africa and do everything in their power to improve the health of those whose lot it is to reside on the coast.

British Medical Association.

A DISCUSSION ON STONE IN THE TROPICS.

By P. JOHNSTON FREYER, M.A., M.D., M.Ch.R.U.I.
Surgeon St. Peter's Hospital for Stone, London;
Surgeon-Lieutenant-Colonel Bengal Army (retired).

In dealing with this subject I propose chiefly to draw attention to the surgical methods of treatment for urinary calculi, and to the results obtained by the introduction of litholapaxy into India. Before doing so, however, it may be well to refer to the distribution of stone in India for the purpose of elucidating the cause of the ailment. I do not of course refer to phosphatic calculi, for the origin of stones of this group are due to catarrh or irritation of the bladder or other portions of the urinary tract. It may, however, be mentioned in passing that calculi of this nature are less frequent in India than in England, possibly because in India prostatic diseases are less common than in England. The native of India does not come to the surgeon for treatment of prostatic ailments, and "catheter life" is unknown to him. He consequently dies of his complaint at an early period of the disease, and the calculi dependent upon the condition are either unformed, or, if present, of small dimensions. What may be termed the "systemic" varieties of stone, namely, oxalate of lime and uric acid, are very prevalent in some parts of India.

The geographical distribution of stone in India is practically confined to the provinces in the North-West. In the Punjab, the North-West Provinces, in Scinde and Gujerat, stone prevails to a marked extent, and the dwellers in Hyderabad, Scinde, are perhaps more afflicted with urinary calculi than in any other portion of the globe. In dealing with the etiology I would draw attention to the following points:—

(1) The geological formation in the stone tract. Although the countries mentioned consist of a huge alluvial plane, watered by the Indus and the upper

reaches of the Ganges, the waters of these rivers are impregnated with cretaceous materials. The tributaries of the Indus and Ganges have their origin in, and pass through, mountainous districts in which limestone is the characteristic geological feature. The drinking water therefore supplied in countries in the stone tracts is highly impregnated with lime salts, causing dyspepsia, and a consequent lowering of the system and digestive powers. In Eastern Bengal stone is almost unknown, because the calcareous geological formation ceases at Oudh, and the dwellers on the banks of the lower reaches of the Ganges, being free from drinking water impregnated with lime salts, are therefore free from urinary calculi.

(2) Meteorological conditions, also, would seem to directly affect the formation of stone. In the regions referred to as being extremely prone to stone the winters are extremely cold and the summers excessively hot. The profuse and continued perspiration occurring during the hot weather causes concentration of the urine so pronounced that the urinary salts cannot be held in solution, and so they drop out, crystallise, and deposit as calculi. The cold of winter upsets the digestive organs, their functions are interfered with, and the chemical salts, finding their exit by the kidney, are in excess.

(3) Diet would appear also to exercise a determining factor in the formation of stone. Sir William Roberts had stated that stone in India was due to the eating of rice. This statement is, however, quite erroneous, as in the countries where stone prevailed rice was but little eaten. Wheat, barley, and other cereals are consumed in the stone tracts of India to a greater degree than rice, and this factor in diet may be of importance in the etiology of the complaint. The eating of flesh does not explain the tendency to develop stone, as the Mahommedans, who are flesh eaters, are exempt practically from stone when dwelling in Eastern Bengal, but are seriously afflicted when residing in the stone-developing countries.

The surgical aspect of the treatment of vesical calculi has been revolutionised since Bigelow in 1878 introduced litholapaxy. The operation was at first severely criticised by Sir Henry Thompson, who was responsible for the practice of lithotrity, or the crushing of calculi at several sittings. In 1885 I reported 111 cases of stone treated by litholapaxy in India, and since then I have practised this operation to the exclusion of lithotrity and lithotomy. In 1884 Lieut.-Col. Keegan advocated litholapaxy as a mode of treatment for stone in children; and, although at first I was opposed to the measure, I have since become a firm convert to Keegan's plan of treatment. In 1895, statistics in connection with the treatment of stone in India were published, the results being:—

Of 147 patients operated upon by suprapubic lithotomy 42·17 per cent. died.

Of 7,000 patients operated upon by perineal lithotomy 11 per cent. died.

Of 10,079 patients operated upon by litholapaxy 3·96 died.

These figures speak for themselves, and when the time the patients were kept in bed or in hospital is considered, litholapaxy still more strongly recommends itself.

Patients operated on by litholapaxy were laid up for from five to six days.

Patients operated on by perineal lithotomy for from three to four weeks.

Patients operated on by suprapubic lithotomy even longer.

The argument that natives of India stand operations better than Europeans either at home or abroad is altogether a fallacy. The excellent results obtained from surgical operations in India in general, and for stone in particular, is not to be explained in this way. The native of India suffers from kidney disease to an extent but little, if at all, less than do Europeans.

Natives of India age more quickly than do Europeans, and stone develops at an earlier age in adults. The calculi in India are, as a rule, larger than those met with in Europe, simply because the European comes at an early period of the disease for treatment. Nowadays the size of calculi obtained at operation is decreasing in India, because owing to the introduction of litholapaxy, and doing away with cutting operations, the natives of India are coming earlier for treatment. It was a mistake to think that prostatic enlargement was less common in India than in Europe; it is simply because the native does not understand "catheter life," and dies speedily of the renal complications induced by the prostatic hypertrophy.

DUST AS A VEHICLE FOR THE GERM OF CEREBRO-SPINAL FEVER.

By MAJOR W. J. BUCHANAN, B.A., M.B., D.P.H., I.M.S.
Superintendent, Central Prison, Bhagalpur, Bengal.

In an article published in the *Journal of Hygiene* in April last (No. 2, p. 214), I made a contribution to the little known subject of the etiology of cerebro-spinal fever, based on an examination of the forms of labour from which prisoners attacked with this disease came during a long series of cases of this disease in the Central Prison, Bhagalpur.

In that paper I referred to forty-seven cases of epidemic cerebro-spinal meningitis, and I have now to add thirteen more, making sixty in all, and will briefly rehearse the evidence which exists in favour of looking upon dust as a vehicle for the specific organism of this fatal disease. For details, which may be here omitted, those interested may refer to the former article in the *Journal of Hygiene*. I may premise that I have been unable to trace the original source of the infection in this gaol.

The arguments in favour of dust being considered a vehicle for the germ of this disease may here be briefly given:—

(1) The organism of this disease in India has been repeatedly shown to be the diplococcus intracellularis of Weichselbaum, thus proving its identity with the disease as known on the Continent and in America.

(2) This organism has been shown by Jaeger and Germano¹ to be capable of offering considerable resistance to desiccation. Jaeger found the diplococcus in a handkerchief six weeks after being used by a patient suffering from cerebro-spinal fever. Germano made cultures of the diplococcus, and kept it alive, mixed with dust, for eighty to ninety days; and he concluded that this diplococcus is one of the "most

resistant of non-sporogenic bacteria," and that it may well cause infection while floating in the air as dust (Nuttall). In other experiments Councilman² found that the organisms were alive after sixty hours' desiccation, but not after seventy-two hours.

(3) Acting upon Germano's statement as to the resisting powers of this organism, I examined the records of all cases which had occurred in this prison for the past four years, and found that of sixty cases from January, 1897, till June, 1901, no fewer than fifty-seven came from forms of labour in which they were constantly and much exposed to dust, whereas only three cases came from a majority of the prisoners who worked in buildings and on forms of labour where they were but little exposed to dust, as may be seen from the following table:—

Occupations with Exposure to Dust	Cases	Indoor Occupations without Exposure to Dust	Cases
Public works and roof re-pairing gangs	5	Factory weaver	2
Gardening gangs	11	Factory store-room	1
Brickfield gangs	4		
Road sweepers	2		
Limekiln	2		
Road-making	10		
Food preparation gangs—			
Cooks' attendant	4		
Wheat grinding	8		
Pulse cleaning	3		
Rice husking	7		
Rice cleaning	1		
Total	57	Total	3

The so-called "dusty" occupations only furnished labour for a minority of the inhabitants of the prison, yet almost all the cases of this disease came from this minority.

(4) Again, the monthly distribution of the cases is in favour of a dustborne origin. The most dusty months in India are those of the dry hot weather and of the dry cold weather; in the rainy season, from the middle of June to the end of September, air-borne dust is at its minimum. The cases occurred as follows:—
The dry hot months (March, April, May) ... 37 cases
The cold dry months (October to February) 19 "
The rainy season (June to September) ... 4 "
This shows at once the difference between the dry dusty months and the rainy non-dusty months.

(5) Moreover, the few cases which did occur in the rainy months also support this theory, for these cases came all from forms of grain cleaning, where the dust is just as great at one time of the year as at another.

(6) I had compiled elaborate tables in an endeavour to trace a connection between certain barracks and cases of this fever, but though certain barracks have furnished more cases than others, yet the times of the occurrence of these cases by no means pointed to infection derived from the ward; indeed, out of twenty-two barracks in the prison cases have come from all but four, and in the different outbreaks the number of cases have come as follows:—

Outbreak 1	6 wards affected
" 2	10 " "
" 3	9 " "
" 4	8 " "

¹ *Zeitsch. f. Hyg. u. Infekt.*, xxvi., p. 288.

² *Boston Board of Health Report*, 1898, p. 78.

(7) Certain wards escaped in nearly all outbreaks, for example, Nos. 1 and 2, where factory (that is, non-dusty) prisoners are confined, only had one case in over four years. The wards which produced most cases were those in which short-time prisoners were housed, and these are the men usually chosen for the non-skilled forms of labour, such as shown in the table above. The long-term prisoners who worked in the factory at weaving, spinning, and other forms of skilled labour, and were not exposed to dust, escaped from this disease.

(8) A close examination of all the associations and surroundings of the cases as they were admitted failed to discover anything pointing to direct contagion, and in no case were those in attendance on the sick attacked.

(9) Acting upon this theory that dust, either atmospheric or that produced copiously in the various processes of husking and grain cleaning, was the vehicle for the distribution of the germ of the disease, I seven months ago took in hand a workshop from which eight cases had occurred in 1900. First I had a brick-on-edge, well-cemented floor made, the walls were then thoroughly scraped and tarred, and afterwards lime-washed, the mat-and-tile roof was renewed and thoroughly lime-washed, and the floors were regularly swept and deluged with perchloride lotion. Next taking advantage of a custom of the natives, who, when they go along a dusty road like to cover up their mouths and noses with a cloth, I had issued to each workman a piece of cloth for this purpose, and I saw that they wore them while at work on the very dust-producing labour of husking rice.

So far theory, but the result proved admirable, for from a form of labour which produced eight cases in 1900 not a single case came in this year, though the occurrence of cases in the road and garden gangs showed that the germ was certainly present. I can see no reason, beyond the precautions taken, why these grain-cleaning gangs should have this year escaped.

In conclusion, I would recall the attention of medical men in the tropics to the existence of cerebro-spinal fever, which has every claim to be reckoned with as one of the continued fevers of the tropics.

FOUR CASES OF LIVER ABSCESS TREATED BY TAPPING BY TROCAR AND CANNULA, AND SYPHON DRAINAGE (MANSON'S METHOD).

By JAMES CANTLIE, M.A., M.B.Aberd., F.R.C.S.

Surgeon, Seamen's Hospital, Albert Dock; Lecturer Applied Anatomy, Charing Cross Hospital.

RECENTLY I have had further opportunities of testing Manson's method of treating deep-seated liver abscesses, namely, by tapping the abscess by a large trocar and cannula, introducing a large drainage tube stretched upon a metal rod through the cannula and applying syphon drainage to carry off the pus.

Of the four cases all operated upon within the last twelve months, three recovered and one died. The fatal case (an Indian) was, however, undertaken merely for purposes of relief, the patient being almost

collapsed when admitted to the hospital. The four cases complete a series of twenty-eight cases in all I have operated upon by this method, of which twenty-four recovered. Of the four cases that died two were the first operations of the kind I attempted; a third was not under my care after the operation, having been only called in to perform the operation itself; and the fourth was the case mentioned above, in which a successful issue was well nigh an impossibility.

The operation of treating deep-seated liver abscesses by trocar and cannula, in place of by hazardous cutting methods, were fully advocated at the meeting of the British Medical Association in 1900. On that occasion Colonel MacLeod, Dr. Manson, and others, testified to the advantages accruing to this line of treatment, and none of those experienced in tropical diseases who were present dissented from the views expressed. I have become more convinced than ever of the efficacy and safety of treating liver abscesses by the trocar and cannula, and still more ready to condemn operations by the knife.

The chief argument against the use of the trocar and cannula is that it is "unsurgical," whatever that may mean; and the advocates of the use of the knife declare any other method as being "timid" surgery; that they like to have "a good view of what they are doing," and that they like "to look their enemy in the face." These are not scientific arguments, but mere statements, and flavour of surgical braggadocio; and they are not statements that admit of scientific discussion. The unanimous opinion passed at the meeting last year was that operations as usually performed by the knife were over-heroic, that they were unnecessarily severe, and that they offered certainly no advantages in results.

My chief argument against cutting operations is that the severity of the operation in many cases is such that the opening of the abscess is apt to be deferred until too late in the disease. To cut down by way of the chest, the pleura, the diaphragm, and the peritoneum to reach a liver abscess is an ordeal that the patient, if he knows anything of the treatment contemplated, is apt to shrink from, and even the medical practitioner is willing to try every available resource before condemning his patient to so severe a line of treatment. Again, hepatic abscesses occur for the most part in tropical countries where skilled help may not be available, where trained nurses are unknown, where the appliances for surgical operations may be but few, and where, therefore, heroic operations do not commend themselves, and can only be undertaken at great risk to the patient.

What after all is demanded when pus accumulates in or around the liver? Free outlet to the pus and efficient drainage. The simplest method of obtaining this is the best, and I contend that the simplest, safest, and most ready plan is by the trocar and cannula, and the introduction of a drainage tube of sufficient size to ensure that the pus may escape without let or hindrance. The size of the tube necessary to permit of such drainage has been much exaggerated, and I believe that, with syphon drainage, the size of the tube we use after tapping by the trocar and cannula will diminish rather than increase as

time goes on and we gain more experience. The suction obtainable by syphonage is considerable, and often errs on the side of being too severe, for along a moderately small-sized tube even thick liver pus will readily pass.

It will be noted that my arguments in favour of the trocar and cannula are in connection with deep-seated liver abscesses, not abscesses which actually bulge either towards the abdominal wall or the ribs, so that the pus is close below the surface. The abscesses have in these instances been left so long that the pus has burrowed its way to the surface, and the so-called "operation for liver abscess" is merely setting free pus which had perhaps its origin in the liver, but is now a mere subcutaneous collection. To argue upon the advantages of any kind of "operation for liver abscess" in cases of this sort is a mere misnomer—it is merely letting out subcutaneous pus. In the first place the abscess should never have been allowed to advance so far that the pus actually causes the parietes to bulge. The practitioner has either failed to diagnose the case, or has from timidity hesitated to operate. There is but little excuse for any practitioner allowing pus in the liver to gain such proportions that the abscess can be felt either to bulge or to fluctuate. Therefore I debar all such advanced abscesses from being considered seriously. With abscesses allowed to attain such unjustifiable proportions, it matters not what operation is undertaken, and cutting is perhaps the better. But it is not these abscesses I am dealing with—abscesses which should never have been allowed to develop so far—but with deep-seated abscesses which do not bulge either towards the anterior abdominal wall or towards the right lower intercostal spaces. I speak of deep-seated abscesses, and of these only, for they are the only collections of pus in the liver or its neighbourhood which present any difficulty. I have previously classified liver abscesses as suprahepatic, intrahepatic, and infrahepatic or subhepatic abscesses. Of these three varieties the last is quite rare, and but four cases are on record. The suprahepatic and intrahepatic abscesses are the forms usually met with; the former, the suprahepatic variety, being met with between the layers of the suspensory (or broad) ligament of the diaphragm, and involving the liver but to a small extent; the intrahepatic variety, as its name implies, occurs within the liver substance; suprahepatic abscesses constituting the majority of liver abscess which are said to collect "at the back of the liver," and from their situation press primarily upon the diaphragm and bulge upwards towards the chest. They are necessarily deep-seated, and to reach them either the peritoneal cavity or the pleura has to be traversed. Intrahepatic abscesses in the early stage—in the stage in which they *ought* to be reached by operation—are necessarily also deep-seated. When the pus has bulged towards the liver surface and caused adhesive peritonitis and parietal bulging—a stage it should never have been allowed to attain unless the patient has not been under observation—it is no longer deep-seated, and anyone, however unskilled in operations of the kind, can proceed to deal with it.

My contentions are:—

(1) That pus should be sought for early, the moment, in fact, that there is a *suspicion* of liver abscess.

(2) That it is perfectly safe, with the precautions mentioned below, to search for deep-seated pus by the hollow needle of a syringe or an aspirator.

(3) That it is unnecessary to expose the liver before aspirating. Exposure of the liver surface when the pus is deep-seated shows nothing, adds nothing to one's knowledge of whether or not pus is present, is no guide where to put in the needle, and, if pus is found after the liver has been exposed by a laparotomy, there is greater danger of the escape of pus into the abdominal cavity than when the needle is introduced from the surface and no laparotomy performed. Colonel MacLeod related a case at the meeting of the Section of Tropical Diseases at the British Medical Association in 1900, in which a surgeon performed laparotomy in a case in which liver abscess was suspected; that, when the liver was exposed, no further steps were taken because the liver looked quite normal, yet two or three days afterwards the patient passed a quantity of liver pus by the rectum. The exposure of the liver, therefore, may prove of no diagnostic value; and its exposure frequently proves a deterrent to recovery should pus be found.

(4) Should an abscess be seen after laparotomy to bulge on the surface of the liver, it is farcical to suggest stitching it to the edges of the wound before opening. If the abscess is of even moderate dimensions and its walls thin, the first puncture of the suture needle either pricks the wall of the abscess or so thins them that pus escapes, either in quantity or, still worse, in dribblets, and the surgeon is in a fix. Packing with sponges, washing out the abdominal cavity, subsequent suturing, &c., are well enough on paper, but they are not quite what the surgeon wished for or expected when he began his operation, and the precautions constitute "the best that could be done" under the circumstances, but he had rather the circumstances had not happened.

(5) It is well to disassociate the operation for hydatids and for deep-seated abscesses of the liver once and for all. The surgical steps in the former are not applicable in the case of the latter. The operations are quite distinct as the circumstances are seldom even approximately the same. Neither in their etiology, pathology, or treatment are hydatids and primary abscess of the liver identical. Hydatids no doubt suppurate, and a collection of pus, the result of a hydatid, may require special treatment, but the ordinary hydatid and the hepatic abscess are as far apart in their surgical bearings as in their etiological.

(6) To reach a liver abscess by way of the chest, removal of a part of a rib or ribs, stitching the layers of the pleura together, cutting or tearing a pathway through the diaphragm, and if the abscess is intrahepatic, opening the cavity of the peritoneum to reach it, or if suprahepatic, possibly missing it altogether, is a procedure which may occasionally be justifiable, but I have never met with a case of the kind, nor do I ever expect to. It is this operation especially which is regarded as over-heroic, and I have no hesitation in declaring against it absolutely. It is declared as being the only properly "surgical"

procedure, and all who do otherwise are accused of surgical cowardice. Well, many good men, the men whose opinion I respect most in connection with this subject, are under this terrible ban, and I am content to place myself in line with them, and still consider we are doing the best for our patient.

When a liver abscess is suspected pus ought to be sought for without delay. This is done by introducing the hollow needle of an aspirating syringe or of an aspirator into the liver. If not found at once the needle may be inserted again and again—say six or seven times or more—into the liver in different parts, or until pus is found or believed to be non-existent.

In my opinion the pus ought never to be sought for by a hollow needle unless the surgeon is prepared to operate at once should pus be found. In London hospitals, and in private practice at home and abroad, it is customary for a physician to first search for pus in his patient's liver, and then having found it, inform the surgeon that he wishes an operation performed. This is a dangerous procedure and one which no one is justified in doing. No physician ought to search for pus in the liver without a surgeon standing by ready to operate at once; or if the medical practitioner is abroad where he acts as both, he must always be prepared to follow up the finding of pus by a surgical operation. The reason for this is obvious, for were a thin walled abscess near the liver surface pricked in one or more places by a needle, the pus may quickly escape thence into the peritoneal cavity.

It is well to introduce the needle again in one or two places around the needle puncture at which pus has been found, to ascertain the lie of the abscess, so that drainage may be applied to the lowest part of it. Never introduce the same needle by which pus has been found into another part of the liver, or at least until the needle has been thoroughly cleansed.

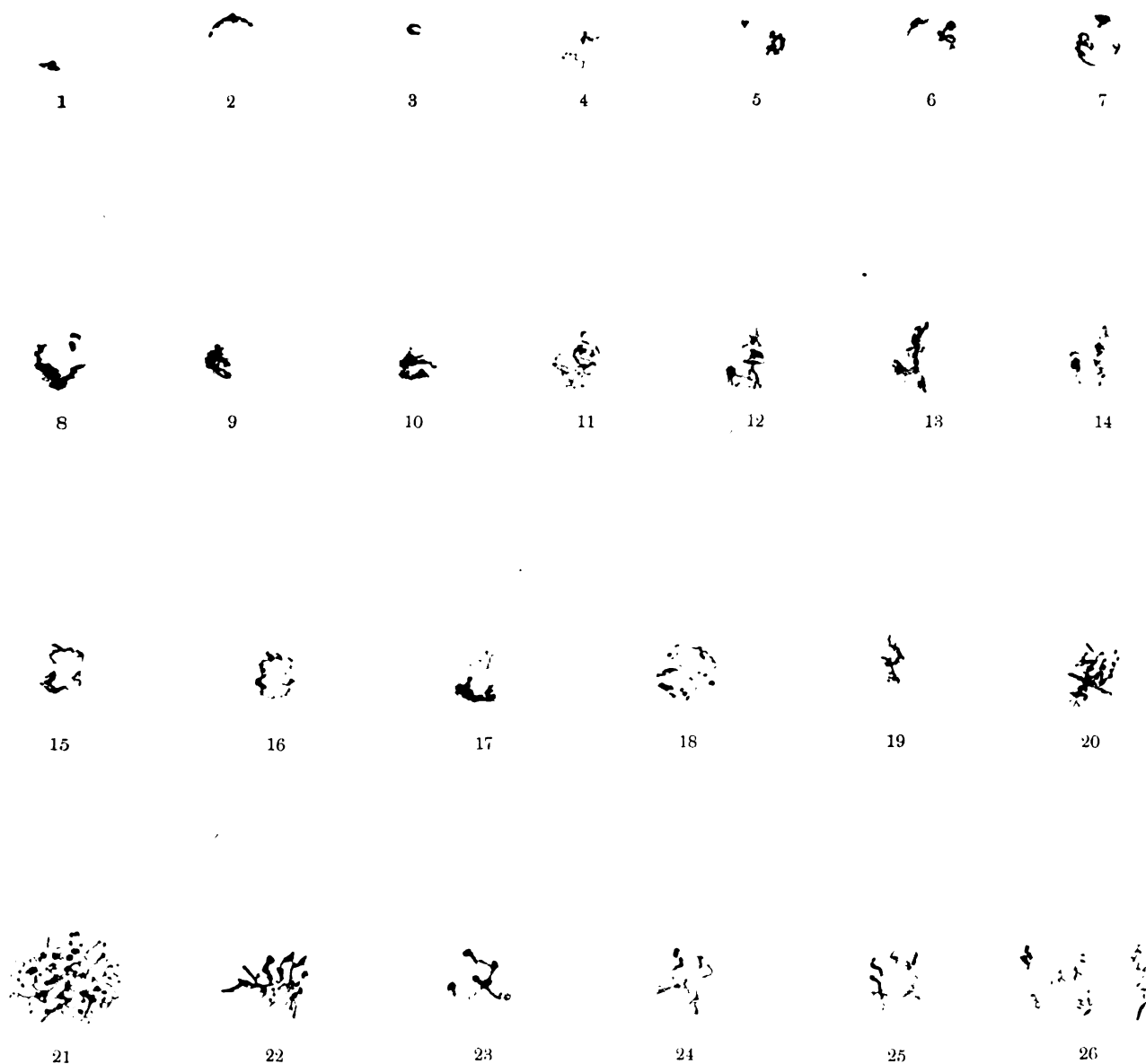
Immediately the pus is found, and the lie of the abscess made out, incise the skin at the seat of the needle puncture for about three-quarters of an inch to admit the trocar. Plunge the trocar and cannula into the abscess, either through the chest wall, between the ribs or through the abdominal wall, maintaining the direction followed by the hollow needle. It is well when aspirating to notice the most superficial point at which pus issues whilst the needle is withdrawn, the most superficial part being the distance to which only the trocar and cannula need be introduced. Now withdraw the trocar; stop the pus as it issues through the cannula from flowing by placing the thumb over the mouth of the cannula, as it is unwise during this stage to allow the abscess to empty completely; stretch the specially prepared rubber tube, some nine inches long, with perforated ends, which I show you, on the long metal rod, and pass both through the cannula until the bottom of the abscess cavity is felt; slip the cannula out, and remove it over the stretched tube; relax the tube so that it shrinks towards the bottom of the cavity by steadying the end of the metal rod there, withdraw the rod, and leave the drainage tube in the abscess. The tube may now be stitched to the skin *without* the suture penetrating the lumen of the tube. Into the end of the projecting drainage tube insert a piece of

glass tube of suitable size to fit the tube, and about three or four inches long. To the distal end of the glass tube fit a long piece (some four or five feet) of tubing, which serves to conduct the pus to a bucket by the side of the bed. The bucket should contain a sufficiency of antiseptic (carbolised) fluid to cover the end of the tube to the depth of several inches. A weight, or a piece of lead on a string (clip forceps will do temporarily), ought to be attached to the end of the tube to prevent it slipping from the bucket. The tube should be filled with warm boracic lotion, if the pus is not issuing freely enough to find its way into the bucket, taking care that the fluid and pus are not forced back into the abscess cavity whilst the tube is being filled. This can be prevented by grasping the tube close to the body between the finger and thumb. Now surround the tube as it issues from the side with wet antiseptic gauze, and cover by the usual dressings.

The subsequent treatment consists chiefly in watching the flow of pus. If the patient complains of a dragging pain in the region of the liver or shoulder, raise the bucket from off the floor so that the syphon drainage is less powerful. Do not attempt to wash out the tube, or the abscess cavity, unless the flow has absolutely ceased, and the temperature is going up. Let all remain unchanged except the dressings, if the temperature is satisfactory, until the fluid through the glass tubing is seen to be bile-stained, when the drainage tube may be cut off close to the body, and after a day or two a smaller and shorter tube used to replace it. The tube is gradually shortened until the wound heals.

CASE 1.—T. W., male, aged 40, marine engineer, native of England. Went to China in 1889 in perfect health and continued so until October, 1900, when he had an attack of dysentery. He remained in hospital nine weeks and made a good recovery. On March 12th, 1901, he came to England for a holiday. During the first week of April, 1901, he experienced a severe pain in his right side, which got worse day by day. He had no rigor, but felt feverish and had occasional night sweats.

On April 25th he was admitted to the Seamen's Hospital, Albert Docks, London. On admission the patient looked sallow, anæmic, and thin, having lost about three stone in weight. He complained of pain in the right shoulder and in the right side over the region of the liver. His tongue was coated and of a yellowish tinge; appetite poor; bowels moved naturally once a day; and, on the day of admission, the temperature was 99° F. at 2 p.m., and 101.2° F. at 10 p.m. The area of liver dulness was increased in every direction, but not more than about one inch in an upward and in a downward direction. In the epigastrium the left lobe was felt to be distinctly increased in size, so much so that attention was directed towards the left lobe as being possibly the seat of the trouble. This belief, however, was dispelled after a day or two's observation, and it was recognised that the enlargement of the left lobe was but the compensatory physiological enlargement consequent upon the left lobe taking up the work left undone by the diseased right lobe. There is distinct but not severe tenderness over the liver on percussion;



To illustrate the Article (Part I.), by W. Leonard Braddon, F.R.C.S., "On Undescribed Hæmatozoa of Malaria." Page 299.

DESCRIPTION OF PLATE.

FIGS.

1, 2, 3.—Young forms of branching parasite in disc free of hæmoglobin. $\times 850$. W. L. B. May 5.

4–10.—Two or more young branched parasites in same corpuscle observed at intervals of 15 seconds. W. L. B. May 5. $\times 850$; discs decolourised.

11–18.—Single parasite at intervals of 10 seconds.

19–22.—Free branched forms; last deeply stained after 20 minutes.

23–25.—Intra-corpuscles; after 20 minutes' staining.

26.—Small free forms.

E. M. B. July 1. $\times 1200$.



when the liver is grasped between a hand placed behind and another in front acute pain is elicited in the right shoulder. Spleen is not enlarged. Urine specific gravity 10·28, rather dark in colour; no albumen, no sugar; bile pigment a trace. The patient has a slight cough and some mucous expectoration. Heart normal; pulse 84, rather feeble. The patient suffers from sleeplessness, getting only a few snatches at a time; he ascribes the sleeplessness to the pain in the shoulder.

May 1.—The patient was given an anæsthetic, and pus was found three and a half inches from the surface in the right mid-axillary line between the seventh and eighth ribs. A large trocar and cannula was at once plunged into the abscess, and a large drainage tube, stretched on a metal rod, introduced through the cannula. Pus to the amount of twenty ounces was drawn off at the time. Syphon drainage was applied and the tube stitched to the skin.

May 2.—The morning following the operation the temperature fell to 97·4° F.; in the evening the temperature rose to 100° F.

May 3.—The temperature kept to the normal during the 3rd, and below the normal both morning and evening during the 4th, 5th, 6th, 7th and 8th days. The patient was now practically convalescent.

May 10.—During movement in bed the patient violently pulled in the drainage tube and it slipped out. It was found impossible to replace the tube, so an anæsthetic was given and the tube inserted.

May 26.—The patient has continued fairly well, the temperature never rising over 100° F.

June 1.—Not so well. Congestion of base of right lung, and some blood in expectoration.

June 3.—As the patient did not improve and dulness continued at base of right lung and an empyema was suspected, the patient was again anæsthetised, the abscess cavity explored by the finger, a counter opening made, and free drainage established.

June 5.—The discharge from liver practically nil; but cough and expectoration continued.

June 11.—Liver abscess almost healed, but the temperature keeps up, reaching in the evening 103·6° F. Erythematous patches appeared on the inner aspect of the right forearm and the outer aspect of the right, evidently of a pyæmic nature; pulse 116; respirations 32; expectoration muco-purulent and more profuse.

June 12.—Both lungs are consolidated at the base, the right lung being affected as high as the middle of the scapula.

June 14.—Expectoration profuse, tinged with blood.

June 17.—Patient much improved, blood disappeared from the sputum, which is now muco-purulent.

June 24.—The temperature has been below and just above normal during past week.

July 1.—An abscess of pyæmic origin evidently was opened in the right forearm to-day.

July 10.—The patient quite convalescent and about to leave the hospital.

CASE 2.—W. W., aged 26, trooper 5th Dragoon Guards, native of England; served in India and South Africa. Whilst in India the patient had "fever" on several occasions and pneumonia, but

never had dysentery. In South Africa he arrived in good health, but during April, 1900, had an attack of "remittent fever," with diarrhoea, which lasted one month. There was no blood passed at stool, but on May 7th, 1900, whilst about to sail from Durban to England, he noticed pure blood in stools for the first time. Blood continued to be passed at stool up to August 1st, 1900. During the early part of July, 1900, pain developed under the right costal cartilages of a "shooting" character; the pain gradually increased in an upward direction, and affected the right shoulder. During July and August, and up to the time of admission to Seamen's Hospital, September 21, 1900, had regular nightly attacks of rigors, fever, and subsequent sweating, with occasional attacks of vomiting.

On admission to the Seamen's Hospital, Royal Albert Docks, on September 21st, 1900, the patient looked anæmic and thin. Digestive system: Tongue coated white; appetite good; constipated. There was pain and tenderness in epigastrium and over the liver generally. Area of liver dulness considerably increased, extending from the lower border of the fourth rib to two inches below the costal margin in the nipple line. There is hepatic fulness in epigastrium and increase of liver area. Spleen dulness not increased, but there is tenderness on pressure in the region of the spleen. Temperature 101·6° on admission. He complains greatly of pain in the right side and shoulder, and of not having slept well for a considerable time.

September 25.—The liver abscess was operated upon by Manson's method. Pus was found four inches from the surface of the chest by an aspirating syringe, and a large trocar and cannula immediately introduced, when twelve ounces of pus escaped. A large-sized drainage tube stretched on a metal rod was introduced through the cannula and the tube cut short; no syphon drainage was established at first.

October 4.—The pus flowed freely enough after the first day or two. The patient is comfortable, temperature subnormal, and appetite good.

October 28.—A small quantity of pus only, but the tract of the abscess cavity seems very long—as much as six inches, and causing some difficulty in drainage. It is contemplated to open the cavity further back so that the pathway to the surface is shortened.

November 9.—Still difficulty in getting free escape of pus owing to length of purulent tract. Patient unwilling to be operated on again.

November 15.—Discharge almost nil; tract healing. Patient convalescent; left hospital shortly afterwards.

CASE 3.—W. B. C., aged 52, native of England. He was in excellent health when he went to South Africa in 1879. Health remained good until the month of December, 1897, when he contracted typhoid fever in Johannesburg. From the attack of typhoid he seemed to recover perfectly. Present illness dates from December, 1899. The patient was then in Durban when he was attacked by "jaundice" and "fever" with marked perspirations. His ailment was diagnosed as "catarrh of the stomach." The initial attack lasted about one week. During the following three months he had several recurrences, but none so severe as the first. The attacks described

by the patient consisted mostly of recurrent febrile attacks which occurred during the night, when he had fever, bile in the urine, and severe perspirations. On the following morning the fever and jaundice symptoms, as a rule, had disappeared, and he was able to be out and be at work. The patient left Durban on April 27th, 1900, for Pietermaritzburg, where for two months he kept quite well. In June, 1900, however, the "jaundice" and feverishness returned and the diagnosis of sorbutic jaundice was made. This, however, no doubt on account of the accompanying increase of temperature, was altered to malarial jaundice. The patient subsequently went to Grahamstown, where for nine weeks he had weekly attacks of "liver and jaundice." The attacks from the patient's description were like ague with shivering, heat, and perspirations. December, 1900, the patient came to England, during the voyage home he had no "attacks"; on arrival in London, however, he had a slight recurrence, but not of sufficient severity to prevent him going to Birmingham on the next day. Immediately on arrival in Birmingham he had attacks every second day for three weeks. He was jaundiced and confined to his room; the diagnosis made, if the patient can be believed, was that he was suffering from gall stones. During this period he lost weight rapidly, and since the commencement of his illness had lost in all about 40lb. weight; he entered a private hospital in Birmingham, where, during his five weeks' stay, he had no fever or attack of any kind. During the time he was in hospital he was on strict diet. For about five weeks after leaving hospital the patient had no fever, no jaundice, and he increased in weight.

About the end of April, 1901, pains recurred in the back and over the pit of the stomach; the pain was not acute, but dull and wearying. This attack was different to any the patient had suffered from previously. He went to hospital, but, although an operation was contemplated, it was postponed. During the period of his stay the liver became enlarged and tender, he vomited when first taken ill, and had frequent attacks as if from ague.

When seen by me in London the patient was under the care of Dr. Rotherol. The patient was very thin, and with a jaundiced tinge of feature. Daily his temperature rose to 100° and 101° F. Breathing normal, lungs normal; pulse 80 to 95. There was no cough, but a gnawing pain persisted in the right hypochondrium. On examining the abdomen the right side of the chest wall bulged considerably, and there was subcutaneous œdema over the seventh and eighth ribs in the anterior axillary line. The liver could be made out to be enlarged slightly upwards; but there was no protrusion or dullness below the right rib cartilages. In the epigastrium the liver was but slightly tender, and occupied a normal position. The patient had been seen the day previously by a physician in consultation, who provisionally diagnosed hydatids, and advised operation.

June 16, 1901.—I came to the conclusion that the patient had a liver abscess, and, after the patient had been anæsthetised, searched for pus between the seventh and eighth ribs. Some two inches from the surface pus was found by an aspirating syringe; a large

trocar and cannula were plunged into the abscess, a drainage tube passed through the cannula into the cavity of the abscess, and syphon drainage established. The pus that escaped through the cannula squirted out with great force, showing that it was under considerable tension. The pus was of a light yellow colour, very thin, and with a slight greenish hue, indicative of long retention.

There is nothing further to record in this case except an uninterrupted recovery. On June 18th no pus was escaping by the drainage into the bucket in which the end of the drainage tube was placed, and the patient's temperature being normal, the tube was cut off short within a couple of inches of the side of the chest.

June 29.—No pus now escapes by the small drainage tube placed in the mouth of the sinus; and the patient is convalescent.

CASE 4.—S. S., aged 50, native of Zanzibar, a coal trimmer on board ship; last voyage from Australia. Admitted to hospital after twelve days' illness; no other history obtainable. On admission, the patient was emaciated, weak, and almost in a state of collapse. The breathing was shallow; the respirations were at the rate of 40 per minute, pulse 78; temperature normal. Liver dullness increased in axillary, nipple and median lines. Epigastrium very prominent, and evidently pushed forward by the liver. On the first day of admission a large stool was passed, looking like custard, but with no fœculent matter. The patient has been maintained during the last twenty-four hours by constant feeding in small quantities by brandy.

September 3.—Pus was found by an aspirating syringe, and a large trocar was passed deeply into the abscess; about eight ounces of pus flowed; a large drainage tube was inserted, and cut off short. No amœbæ were found in the pus. During the night the patient tore off the dressings, and with them the drainage tube was removed. The drainage tube could not be satisfactorily replaced.

September 6.—A great quantity of bile-stained pus escapes into the dressings, necessitating frequent change. The stools are very frequent, every half hour during some part of the day. The stools still preserve their custard-like appearance.

September 7.—A large drainage tube was introduced to-day, when some twenty ounces of pus welled out of the wound. In three hours afterwards, and again after an interval of four hours, large quantities of pus saturated the dressings.

September 8.—Great quantities of discharge still issue from and around the tube. The discharge consists of a bile-stained fluid of yellow, green, and brown hues. The patient is very weak, restless, and at times collapsed. Stools very frequently and passed unconsciously, and containing but little fœcal matter.

September 9.—For the first time amœbæ found in the pus. The patient grew gradually weaker and died on September 12th.

Post-mortem examination.—No adhesions had formed between the liver and the abdominal wall around the seat of operation. Old adhesions were found at some distance from the seat of operation between the right lobe and the under surface of the diaphragm. No adhesions had formed between the liver and intestines.

No fluid in the peritoneal cavity nor any signs of peritonitis. In the substance of the right lobe of the liver two abscesses existed, each about the size of cricket balls, separated by a partition about one inch in thickness. The trocar and cannula had traversed this partition, and had reached the far abscess, thus accounting for several of the peculiar features in connection with the case.

Three of the cases—1, 2 and 4—were patients in the Albert Dock Branch of the Seamen's Hospital. They were all under Dr. Manson's care, and the abstracts are from the notes of the cases taken by Dr. W. G. Ross, senior resident medical officer in the hospital. Case 3 was under the care of Dr. Rotheroe, to whom I am indebted for notes of the case. All the cases, with the possible exception of No. 2, were intrahepatic abscesses. Cases 1 and 4 were distinctly post-dysenteric; the others gave no definite history of dysentery. In case No. 3 the attacks seem to have been of a malarial nature; and intermittent malarial hepatitis, if we can recognise such an ailment, would seem to best describe the attacks described by the patient. Case 4 was operated upon for the purpose of relief merely.

THE SPINAL CORD, PERIPHERAL NERVES, AND SKIN IN MACULO-ANÆSTHETIC LEPROSY.—By Oskar Voit. (*Lepra*, vol. i., fasc. 1 and 2, p. 50; also fasc. 3 and 4, 1900. With a plate, tab. 7, in fasc. 3.) In a series of articles in this new publication, Dr. Oskar Voit describes the condition of the spinal cord, the peripheral nerves, and the skin in maculo-anæsthetic leprosy. The author found degenerative changes in the spinal cord, but as similar processes are observed in other diseases they cannot be regarded as distinctive of leprosy.

The author's microscopical specimens were examined by Professor Schultze, of Bonn, and Professor von Shrumppell, of Erlangen, and both these authorities coincide with Dr. Voit in his opinion that the changes in the spinal cord are not specifically due to leprosy, and do not explain the signs and symptoms of maculo-anæsthetic leprosy. Bacilli were never discovered in the sections.

The skin filaments of the peripheral nerves were found to be degenerate; the nerves to the muscles, on the other hand, exhibiting either no degenerative, or very slight changes, thus demonstrating that the nerves to the skin were involved prior to those to the muscles, which in some cases entirely escaped. The author found ascending atrophic degeneration of the sensory nerve branches. He agrees with Hansen and Looft that atrophic changes in the nerve-fibres continues, while the acute leprosy processes in the nerves may come to a standstill.

Though Voit has not personally examined the nerve ends, he concedes to Gerlach's opinion on this point. Dr. Voit, in all, examined nine macules existing in six cases of leprosy of the maculo-anæsthetic type, and only found a few bacilli in the skin of two of the lepers. The author coincides with the opinion of other investigators who state that bacilli are either entirely absent, or very rare, in the maculo-anæsthetic leprosy.

QUARANTINE AND DISINFECTION IN TURKEY.—A correspondent of the *Standard*, September 3rd, 1901, writes that, during the quarantine regulations under which ships are now allowed to touch at Turkish ports, disinfection has to be performed either at Toulza or Clazomene. The following experiences, related by the correspondent, gives a graphic account of the manner in which this operation is carried out in Turkey.

"We embarked on an Austrian steamer for Smyrna, and the Captain chose to undergo his disinfection at Toulza. On arriving there, we found only one big barge, containing, also, only one room, divided into two, half being considered contaminated, for receiving passengers, and the other half clean. This barge was surrounded by perhaps six hundred lighters, other barges, and native boats, waiting for clean bills. We ourselves had to wait for six hours before all the passengers, officers, and crew were made to land on the barge. Here we were ushered into the first room, and were given a bundle of absolutely filthy rough cotton shirts, long enough to reach to the knees, and told to undress to the skin and put on the shirts, while our own clothes were under disinfection. The whole barge was in a state of dirt difficult to describe, and the condition of the shirts, after having been used indiscriminately by hundreds of the lowest classes of bargees, sailors, and third-class passengers of the kind which habitually travel in Turkey, may be left to imagination. Three of us Englishmen declined point blank to undress under these circumstances, and whilst one threw his quarantine shirt in the face of one of the keepers, and jumped out of the window, I burst open the door leading to the clean part of the barge, and going to the doctor, complained of the disgraceful state of the arrangements, and declared that none of us at least would consent to be disinfecting there. The rest of the first-class passengers, who had seemed inclined to submit before, were at length persuaded to join in our refusal, upon which we were told that we should have to go back to Constantinople. On our stating that, if we did, we should not fail to protest most strongly, and when they saw we had no intention of yielding, the incident ended in our simply paying the usual fee of five piastres, which is levied on all who pass through this quarantine station."

This plain narration of facts forms a powerful indictment against the whole system of quarantine as practised in Turkey. Dirty linen on board ships is not touched, whilst passengers who are quite clean, and in a perfectly satisfactory sanitary condition, are made to run the risk of all sorts of abominable infectious diseases, easily transmissible from the last wearer of the loathsome common quarantine garments. The rule of exacting payment, even from the poorest, is also much to be condemned, as not only does it press hardly on many, but as it must bring in a considerable amount to those concerned, it encourages the continuance of vexatious quarantine, and leads doubtless to a slovenly performance of operations, the main object becoming at once the encashing of the piastres and not the disinfection of the victims.

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THE

Journal of Tropical Medicine

SEPTEMBER 16, 1901.

OMNIPRESENT MALARIAL INFECTION.

THE report we published in the last issue of this paper, Sept. 1st, 1901, on Malarial Infection as dealt with in patients in the Civil Hospital, Hong Kong, is one of the most interesting clinical facts in connection with the subject of malaria we have had brought to our knowledge. Dr. Bell, Acting Principal Medical Officer in the Government Civil Hospital, and Lieut. G. Stewart, I.M.S., examined the blood of some hundreds of patients, irrespective of their diseases, as they presented themselves at the hospital. No matter what was the complaint, the blood of the numerous patients was tested for malarial infection, and a perusal of the article affords ample food for reflection. Malarial parasites were met with in patients suffering from almost any and every disease with which we are acquainted in tropical and temperate climates. In some cases

no apparent malarial infection was observed, but they formed the minority, and it is perhaps safe to say that the absence of signs of infection, in even the small number giving negative results, was apparent merely. The wide-spread, the almost universal, infection of persons brought within the ken of these observers points to the general saturation of a community dwelling in a malarial district. The remark "that persons in a malarial region all have the disease in them, and that only a slight deviation from health is requisite to bring out the evidence of its presence," was never more fully corroborated than by the recent Hong Kong observation. The circumstance opens up a large field for discussion, and although it has been present to many minds that such was the case, it has never received more ample confirmation.

It must be remembered that all the persons examined by Dr. Bell and Lieut. G. Stewart were ill from some cause or other, and it may be that many were rendered liable to contract illness because they were infested with malarial parasites. It therefore does not follow that the whole of the community have malarial parasites in their blood, as it was only the "sick" who were made the subjects of enquiry. There is no doubt that malarial infection reduces the vitality, and renders the patient less capable of resisting infection, whether of a typhoidal nature or of any of the zymotic ailments, and therefore it might be assumed that those with malarial parasites in their blood would more frequently come under the observation of the medical practitioner. To establish the general prevalence of malaria in a community, the blood of the healthy as well as of the sick persons will have to be examined, and we hope that the two men who have, at great pains and patience, given us so much, will complete their interesting work along the lines we have indicated.

If it is shown that malarial parasites are more prevalent in the blood of those who are the subjects of disease than in the healthy, we have proved to us, if indeed we wanted more proof, that malaria lays us more open to contract disorders of various kinds. If, on the other hand,

the community generally—the sick and healthy alike—are equally infected, then comes the question how far malaria plays a part in the mortality of those attacked by other diseases, and how far it is necessary to fight the malarial poison let loose to do damage by the lowered vitality attendant upon zymotic or other complaints? Many problems in treatment suggest themselves, and would require larger space than can be devoted to the subject here. One potent question relates to parturition. If malarial infection is widespread, should the mother be protected from possible post-parturient fevers by the administration of quinine? Must quinine form part of the regular treatment in typhoid fever, smallpox, dysentery, and the many diseases which Dr. Bell and Lieut. G. Stewart have proved malaria to exist in? We hope medical men elsewhere will take up this question and give us their experiences founded upon observations after the manner commented upon.

It will be noted that it was not only in persons suffering from infectious diseases that the malarial parasites were discovered, but also in persons suffering from fractured bones and other traumatic ailments. There can be no connection between a broken leg and malarial poison, but the shock, the altered conditions of life consequent upon the rest entailed, &c., may be sufficient as etiological factors in giving the parasite the upper hand, by defying the beneficent action of the phagocytes. Is it, then, necessary even in cases of broken leg to administer quinine as a prophylactic precaution? The idea may seem far fetched, but in virtue of the evidence before us it would appear that the practitioner will be taking the best interest of the patient into consideration by doing so.

DR. CALMETTE, conductor of the Pasteur Institute in Paris, was severely bitten by a venomous snake whilst at work in the laboratory. A colleague who was present injected an anti-toxin serum immediately, and Dr. Calmette escaped with a swelling of the hand and wrist and a high temperature.

NOTES ON SOME CASES OF (? MALARIAL) IRITIS, OCCURRING IN PERSONS THE SUBJECTS OF MALARIAL FEVER AND RELIEVED BY QUININE.

By ARTHUR T. WHITE, L.R.C.P., M.R.C.S.

Late Medical Officer to the Uganda Protectorate, Equatorial Africa.

THE three cases which form the subject of these notes had all to my knowledge suffered from malarial fever acquired while residing in East Africa, either in the Uganda or East Africa Protectorate, where malaria and its malignant form, commonly known as "blackwater fever," are both very common.

A. S., Soudanese, a sergeant in the Uganda Rifles, stationed at Machakos in British East Africa, was seen by the writer, who was in medical charge of the station in the absence on leave of the Protectorate medical officer, Dr. Mann, in June, 1898, and was then suffering from severe photophobia, with dilated, fixed, and discoloured pupil, and an intensely injected conjunctiva. There was no history of syphilis, and his wife and family, who were both examined later on, were quite healthy. As is commonly the case with Soudanese, there was a great deal of acquired and congenital syphilis in the man's company. The attack had come on suddenly in the evening, after musketry practice in a hot sun and a severe glare. The patient had only been away from the hospital for two days, where he had been for a week previously treated for malarial fever of a quotidian type, with some splenic enlargement. During this time there had been no examination of the blood, as the writer's microscope was not available, owing to difficulties of transport, the result of the then existing mutiny, and there were at the time no appliances for microscopic examination provided in the Government station hospital. As the patient showed no signs of improvement after three days under atropine and hot fomentations, he was put on twenty-grain doses of salicylate of soda. Owing to the severe pain at night, chloral had to be given. On the evening of the eighth day of the disease, the writer mentioned the case, and remarked on its obstinate resistance to treatment, to Capt. Hinde, the District Officer, who had been at one time a medical officer in the Congo Free State. He suggested that it might possibly be a case of malarial iritis, of which he had seen cases when on the Congo with Baron Dhanis' Expedition in 1895, and recommended that the patient should be at once put under quinine. This was done the next day; five-grain doses three times daily, with an aperient, giving marked and immediate results as regards the pain. Within a week the severe pain and photophobia had cleared up, leaving behind a few anterior synechiæ. In this case it will be seen that the man was just recovering from a malarial attack for which he had been treated by quinine. When discharged to duty, he was ordered to present himself for quinine every morning at the dispensary and had not done so, so that at the time the attack came on he had been for some days without any quinine.

The second case occurred in a Soudanese private, B. S., also of the Uganda Rifles, who came to the dispensary at Machakos in the end of July, 1898,

with a history of severe pains in both eyes, with lacrymation and photophobia, which had occurred suddenly, first in one eye and then in the other, some eight days previously. He had been seen in my absence by a medical man who was passing through the station, and had been ordered atropine and hot applications. Owing to writer's absence from the station with a punitive expeditionary column, he was not again seen till a week after the onset, when there was, according to the patient's story, no improvement. Both eyes were severely injected, the pain and photophobia were severe, and there was a diffused haziness in the deeper layers of one cornea, with a fixed irregular pupil of a muddy-brown colour. The patient denied any history of syphilis and showed no evidence of it, but admitted having exposed himself to chance of contagion among the Masai prostitutes, who are mostly infected, previous to his being married. Unfortunately I did not see his wife and child as I was leaving the station directly with a military caravan for up-country, and in the bustle consequent on our return from the expedition, and in the hurry of preparations for an immediate departure, the matter was forgotten. However, remembering my previous case, the man was put on large doses of quinine, with the rapid relief of the pain, and when I left the station three days later he was practically well. There was a history of frequent malarial attacks for some years, ever since he had served in the Unyoro column on the Nile valley, a hot-bed of severe malaria. My notes do not mention how long previously he had had an attack, but it was noted that his spleen was slightly enlarged.

It could not be said that the station of Machakos itself was malarious, the climate being mild and temperate, and the country open grassy plain and free from swamps, but it was so situated at some 3,500 feet above the sea, opposite to a long gap in the hills, through which at night, after sundown, for a great part of the year, a cold wind blew very strongly, that chills were frequent and latent malaria became acute. This was specially noticed during the time the writer was there in May-August, 1898. As the station was on the main road to Uganda from the coast, caravans came through constantly with English officers and officials proceeding from rail-head to Uganda, the scene at the time of the Soudanese revolt, and it was then noticed that two out of every three officers passing through suffered from malaria, many of them for the first time since their landing at Mombasa.

In this case there was no evidence of syphilis, beyond the history of possible exposure, nor of rheumatism, and for reasons already mentioned, the blood was never examined by the microscope, but the history of the case and the quinine reaction point strongly to malaria.

In the third case I was called to see an Englishman in Government service at Luba's Fort, a station on the Victoria Nyanza shore, in January, 1899, then on his way to the coast from up country. He wrote to me that he was suffering from "ophthalmia." When seen, both eyes were very painful and there was considerable photophobia, with, on further examination, evident iritis, as shown by his discoloured, dilated,

immobile pupil. He told me that the attack had come on two days previous to his arrival at the station, when he had been travelling in an open canoe from Port Alice, some three days away by water along the N. shore of the Victoria Nyanza. He had been exposed to the great heat of the sun and consequent glare from the water, having failed to put up an awning in the boat, as should be done by every European travelling in this way. Thinking it to be an ordinary ophthalmia, such as is fairly common in hot climates, he had bathed his eyes as well as he could with boric-acid lotion, but without much relief, and when seen he was in a good deal of distress, from the pain in his eyes and also what he called neuralgia, severe pain over the distribution of the supra-orbital division of the fifth nerve, which was accompanied by profuse lacrymation. There was some conjunctival injection, with a slight muco-purulent discharge. Since the pain in his eyes began he had been feeling "hot" at night and was "not able to get to sleep." His history was that he had had, while up country along the valley of the Somerset Nile, a good deal of fever, but had not had blackwater fever, and had not taken quinine regularly, but only during the attacks. His last attack, which from the history was of the bilious remittent type, had been some five weeks previously. His spleen was enlarged to rather more than one finger's breadth beyond his ribs, and there had been some discomfort and tenderness over the liver, which had passed off while he was on the march. He described his consumption of alcohol as "moderate," which, I believe, is a suitable adjective in his case. At this time there was only a very scanty supply of medical stores available in the station—in fact, little but blue bills, quinine, and Dover's powder, as the stores for the Protectorate, which should have come up long before, were detained at the coast for want of transport, which for some months previously had been monopolised taking up complete and expensive rations for the Biluchi regiment, then in Uganda. However, with some "tabloids" from my hypodermic case, I managed to make some atropine drops, and with these and compresses of trade calico wrung out of hot water, and covered with the waterproof lining of a sponge bag, I managed to make him more comfortable. For the first three days of his stay in the station he got slightly better, the pain and lacrymation abating, although the dimness of vision and photophobia remained much the same. On the afternoon of the fourth day I was called to him and found him with a temperature of 103.6, in the hot stage of a malarial attack. It appeared that during the night previously he had had an attack of acute diarrhoea and belly-ache, following on a meal of sardines tinned in oil, which had been opened the day before, and as there had been some rain during the night, he had probably got chilled in going to and from the latrine, which was some distance from his tent. With the onset of the fever his iritic symptoms became worse, and the pain intense, together with some increased dimness of vision, accompanied by a cloudy, aqueous, and punctate deposit on the posterior surface of the cornea. As he was suffering a good deal from the fever and the pain, I gave him six five-minim tabloids of Burroughs and Wellcome's tinct.

opii, which I happened to have by me. This sent him to sleep and into a profuse sweat in about half an hour. In the light of the other cases, I decided that quinine might relieve his iritis as well as his fever, and with a view to rapid effect, as soon as the sweating began, I gave him three grains of quinine bi-hydro-chloride, which is readily soluble in water, by intramuscular injection, and in four hours another three grains. By the morning the fever had gone, and there was very marked alteration in his eyes; the pain had gone, and though there was some congestion of the circumcorneal zone and some marked discomfort, yet it was much less than before. The next day he had a slight return of the fever, though he was taking five grains of quinine three times a day, but that and the iritis gradually abated, and when he left the station some days subsequently, the irregularity of the still dilated pupil from anterior synechia was the only trace of the attack left. He was advised to continue his quinine, five grains daily, till he left the country, and with the exception of some slight attacks of fever on the voyage, he remained well till the end of 1899, since when I have not heard of him.

With regard to his blood, this was not examined till the morning when the feverish attack began. Luckily my travelling microscope (Major Ross's pattern) arrived from another station, and I was able to examine the blood in fresh films. Under a $\frac{1}{12}$ oil-immersion, there were numerous intracorporeal parasites, of a large size (filling nearly the whole of the corpuscle), with fine pigment granules in many of them. Amœboid movement was present in a fairly active form. There were no crescents seen, but a few parasites were apparently "ring shaped." Many of the infected corpuscles seemed larger than normal.

The blood was examined once again on the morning of the slight rise of temperature following the acute attack. There were a few pigmented parasites, but so few that careful searching was necessary to find them. There was a small amount of free granules of pigment. The general size and appearance was that of the benign tertian parasite. It was not possible to examine stained specimens owing to lack of appliances.

In this last case there was no history of syphilis obtained. He had never had any symptoms pointing that way, though he had exposed himself to the risk of contagion. Syphilis and gonorrhœa were both very rife in the stations of these Protectorates, particularly among the Soudanese women, and also in stations where there are Masai prostitutes. Moreover, in Uganda proper, where the women folk are of a somewhat easy virtue, there is a good deal of disease. But in none of the cases was there any direct evidence of syphilis or rheumatism. Rheumatism, except in those who have had it elsewhere, is, as far as I am aware, unknown in Uganda. Gout, another cause of iritis, was not present either. Accordingly, in the absence of other causes and in view of the associated malaria, I am inclined to the view that these cases are malarial in origin. In each case the reaction to quinine was most marked. To those interested in the subject I would recommend a short but excellent article, by Major M. T. Yarr, R.A.M.C., in the JOURNAL OF TROPICAL MEDICINE for December, 1899, which,

together with the matter contained in his paper read before the annual meeting of the British Medical Association in 1898, gives a great deal of information about the known facts of the relation of malaria to eye diseases, more than can be found in any of the published works in English on ophthalmology or tropical disease with which I am acquainted.—*The Westminster Hospital Reports*, 1901.

SELECTIONS FROM COLONIAL MEDICAL REPORTS FOR 1898 AND 1899.

THIS most important volume consists of selections appertaining to the diseases, geology, botany, afforestation, agriculture, vital statistics, &c., of some thirty British colonies. Although largely taken up with tables and figures, the student of tropical medicine will find interesting and useful reading and information in the selections. This is the first attempt in the direction of producing a compendium of hygiene in its widest sense for the Colonies, and the Colonial Office is to be congratulated on the work. The volume extends to 420 pages, and may be obtained from Eyre and Spottiswoode, Fleet Street, London, E.C.; Oliver and Boyd, Edinburgh; and Ponsonby, Grafton Street, Dublin, at the modest price of 1s. 10½d.

MOSQUITO COLLECTION IN HONG KONG.

The following report by Dr. J. C. Thomson, M.D., M.A., in a report to the Government, gives the results of his examinations of mosquitoes in Hong Kong during the second quarter of 1901:—

"During the months of April, May and June, 1901, 12,539 insects were examined, when 342, *i.e.*, 2·7 per cent., were found to be *Anopheles*, of three species; and 12,197, *i.e.*, 97·3 per cent., *Culex*, of ten species.

"I reserve all consideration of the nomenclature and description of the different species for a general report on the subject of the mosquitoes of Hong Kong, which I propose to submit after my next quarterly statistical report, when my inquiry will have extended over a period of twelve months."

The increase in the number of mosquitoes during the summer months is well illustrated in the following table:—

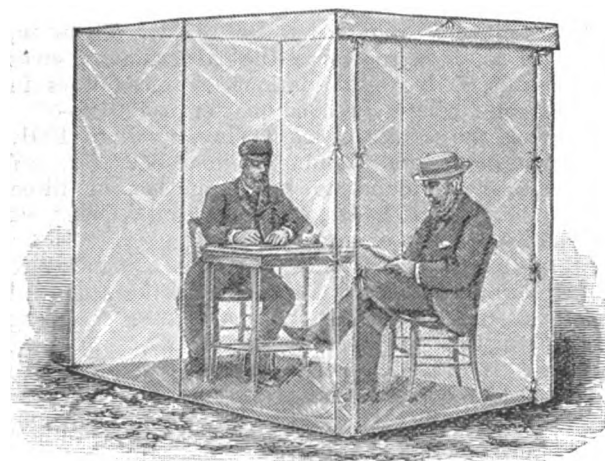
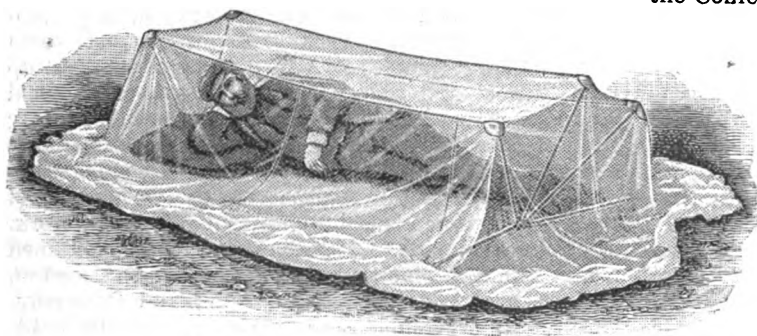
	Mosquitoes Examined	ANOPHELES		CULEX	
		Number	Per cent.	Number	Per cent.
Last quarter of 1900	3,539	294	8·3	3,245	91·7
First quarter of 1901	7,490	227	3·	7,263	97·
Second quarter of 1901	12,539	342	2·7	12,197	97·3

FOR HEPATIC COLIC.—To Chauffard (*Revue Médicale de Normandie*, May 10th) is ascribed the following formula:—

- R Olive oil from 4½ to 12 ounces.
 Cognac... .. ½ ounce.
 Yolks of 2 eggs.
 Menthol 7½ grains.
 M. To be taken in two doses at half an hour's interval.

PROTECTION FROM MOSQUITOES.

MESSRS. WHITE AND WRIGHT, Surgical Instrument Makers, Liverpool, have, at Major Ronald Ross's suggestion, devised a Mosquito Hood and House. The materials used consist of bamboo and ordinary netting, and their lightness and convenience in packing render them easily carried by the traveller. The Hood is to be used when the recumbent position is assumed, and the House is intended for protection during resting, writing, &c. After all our investigations, recommendations, and prophylatic suggestions for protection against mosquitoes, the mosquito net



is the one form that has stood the test of time, and in all probability will continue in use when protection by drugs, by draining of swamps, by destruction of larvæ by petroleum, or other measures, are still being experimented with. Clearing a continent of malaria is a gigantic problem, but the protection of the individual by such simple devices as the Hood and House brought to our notice by Messrs. White and Wright is within the reach of every traveller's means. We recommend every one proceeding to tropical countries, whether to take up residence there or merely as a visitor, not to leave these shores without a House and Hood in their travelling trunk.

Reviews.

DIE LEPRO (leprosy). By Dr. Victor Babes (Wien, 1901).

Dr. Babes' work is well-timed, as at the present moment leprosy in all its bearings is being much discussed. The book discloses a thorough knowledge of the subject and is based upon personal experience. Dr. Babes, in the preface, expresses himself as follows: "In undertaking a somewhat exhaustive treatise on leprosy, I believe that I am on the one hand supplying a want in presenting the important works read at the Conference on Leprosy, and on the other hand in publishing the results of my personal experience on questions that at present are still open ones."

Chapter I. is devoted to an exhaustive history of leprosy from the time of Herodotus to the present day. Chapter II. deals with the geographical distribution and the statistics of the disease. The remainder of the book is devoted to the etiology, pathology, symptoms, diagnosis, and treatment of the disease.

Professor Babes is of opinion that unfavourable sanitary conditions cause the introduction and propagation of the disease, which is more frequent amongst the poor and ill-nourished than in those of a better class.

In only 12 per cent. of his cases was Babes able to prove heredity, but he considers the contagious nature of leprosy to be unquestionable. He has no doubt that leprosy is a "family" disease; in many cases the parents, however, are attacked after the children.

The chapter relating to the pathological anatomy of leprosy is one of the most interesting and important in the book.

Hitherto the author's attempts at sero-therapy have failed; he is nevertheless not baffled, and still lives in hopes of discovering a sufficiently strong toxin to react on the bacilli, by destroying, absorbing, or eliminating them from the system, whilst the same must have no injurious effect on the human body—a difficult and dangerous combination which the author does not lose sight of.

The book is well illustrated, well printed, and well edited. We cordially recommend it to the notice of all our readers.

A MALARIA CONFERENCE IN NEW YORK.—At a meeting of the New York Board of Health, on July 31st, a discussion on Malaria and its Prophylaxis was held. The Board decided to circulate directions, in connection with this subject, drawn up by Dr. H. M. Biggs, to the medical practitioners of New York. The precautions recommended were those adopted in most attempts of the kind, namely, screening houses and beds; the isolation of malarial patients; the administration of quinine during and for a considerable time after attacks of fever; removal of breeding places of the anopheles mosquitoes by drainage, &c., and where drainage was found impossible, throwing petroleum upon the surface of all pools and stagnant water.

Current Literature.

THE TREATMENT OF SNAKE BITE.—C. B. Lall, of the Rajputana Medical Service (*Indian Lancet*, May 20th), reports the case of a native who was bitten by an *Echis carinata* snake, three feet long. He was seen an hour after the bite and was suffering from constriction of the throat, thirst, deafness, noises in the ears, vertigo, partial blindness and muscæ, heaviness and loss of sensation in the legs, with a feeling of heat all over the body. Temperature, 98.2° F. The leg was cold, swollen, and purplish. A binder was at once applied above the bite and the wound incised, squeezed, and filled with potassium permanganate, and the following draught given:—

R	Liquor strychninæ	...	...	8 minims.
	Spirit of chloroform	...	...	15 "
	Water	...	...	1 ounce.

M.

The patient was forcibly kept awake all night. The binder was loosened after an hour. A speedy recovery ensued.

TO ALLAY THIRST IN FEVERS.—The *Clinica Moderna* recommends the following mixture as beneficial in allaying thirst and fever:—

R	Pure glycerin	...	...	7½ drachms.
	Citric acid	...	...	½ drachm.
	Distilled water, enough to make	...	...	25 drachms.

M. Sig. From one to two tablespoonfuls at one dose to allay thirst and fever.

THE following formula to disguise the taste of castor oil has been used by Dr. Barkman, of Texas, for forty-five years:—

R	Castor oil	...	...	1 ounce.
	White sugar	...	...	1 ounce.
	Essence peppermint	...	...	35 drops.

M. Sig. Rub well together. Then add two tablespoonfuls of boiling water and stir until cool enough to drink.—*Medical Brief*, September, 1901.

TABLETS OF HYDROCHLORATE OF QUININE.—In the *Archives de Médecine et de Pharmacie Militaires*, M. Masson alludes to a discovery of M. Ricard's regarding the compressing of hydrochlorate of quinine into tablets. This salt contains four equivalents of water, which it loses when it is heated to 100°. When brought to a temperature of 50°, it loses only one equivalent of water, which it takes up again with avidity. To make the tablets, the salt is mixed with a sufficient quantity of water to form a firm mass, which is granulated and heated to 50°. The added water, plus the one equivalent of water of crystallisation, is then lost. It can then be formed into tablets, which disintegrate completely on contact with water. If placed under a moist bell-glass instead of being immersed in water, they take up again the one equivalent of water, and do not then disintegrate readily. To make the granular mass into tablets 5 per cent. of talc is added, and the mixture compressed while kept warm.—*British and Colonial Druggist*, August 16th, 1901.

THE Pasteur Institute for India, which was opened at Kasauli about a year ago, has done excellent work. Three hundred and twenty-one patients have been treated. The institute is in charge of Major Temple; it is largely used for army patients.

A BUST of Dr. Armaner Hansen, the discoverer of the leprosy bacillus, has been unveiled in the garden of the Museum at Bergen. Dr. Hansen has recently celebrated his 60th birthday. His discovery was published in 1873.

THE ANOPHELES AS HOST OF A TREMATODE.—The Rome correspondent of *The Lancet* states that Marbirano, while examining the stomach and salivary glands of hibernating mosquitoes, found that a large number of these insects acted as hosts of a small trematode worm of the distomida family. These were encysted, and also found free in the thorax and abdomen. "Each cyst contained only one distoma of a flat, leaf-like, form, oval, somewhat elongated, becoming during its active progressive movements after its liberation from the cyst narrow and ribbon-like in shape." Several of the anopheles were also infected with filaria, which were found in the Malpighian tubes.

MATERNITY NURSING IN JAPAN.—A nurse in Tokio, who is occupied chiefly in nursing maternity cases, found it for some time a source of difficulty to dispose of the placenta or to get it disposed of. Not knowing the language, it was awkward for her to make the Japanese servants understand; and there are not many facilities for having it burnt on the little charcoal stoves, &c., which are used in that country. But quite lately she discovered that there is in Tokio a factory, the business of which is to dispose of placentas. On receipt of a card or notification the company will send for it, and either burn or bury it, as desired, for a fixed price; in fact, there are three classes—first, second, and third—each having a different price. The first-class placentas are buried; the second and third class are burnt. There is another thing in connection with this branch of nursing as practised in Japan which is unusual, namely, not tying the cord on either the infant's or the mother's side, but simply cutting it after the pulsation has ceased. A custom very prevalent amongst the Japanese women is the wearing of a tight binder for many months before the confinement. This custom is very much condemned in the local papers as one of the chief reasons for the small stature of the people.—"*Hospital Nursing Mirror*, August 3rd, 1901.

HOW THE ARABS AVOID PRICKLY HEAT.—"Arab" writes to the *Aden Weekly Gazette* as follows:—With reference to an article which has appeared in the *Indian Medical Record*, by Dr. R. R. H. Moore, regarding the use of cocoanut oil for avoiding prickly heat, I beg to state that from time immemorial the Arabs use for this purpose sesame (gingelly) oil. The oil is diluted with water and applied to the parts where the prickly heat is, generally at the time of going to bed. It allays the irritation and dries and removes the pimples in two or three applications. This oil is held in high esteem amongst the Arabs who live in the interior, and who are in the habit of anointing their skins with it when they feel at night fatigued and tired from their day's work, as it gives vigour and firmness to the limbs and body, and enables the workman to get up fresh and vigorous next morning. Besides, during the winter it has some effect in protecting the body from the piercing cold, as the Bedouins go about often naked without

any coat. The oil is used for such a purpose pure without water, and it is rubbed briskly into the skin. Not only in Yemen, but also in Hadramant it is used, and the people universally believe that it conduces to good health. When there is high fever and the body is aching, the skin of the patient, whether he is an adult or a baby, is anointed with gingelly oil, and the patient gets relief, the skin becoming soft, and the temperature reduced. The remedy is resorted to even by patients under the treatment of European doctors here.

The Arabs do not use soap, as it disfigures the body and inflames it in a tropical climate, but they use various other remedies made from the leaves of certain trees which are obtainable very cheaply in abundance, and which are as efficacious as soap for removing grease, oil, and dirt, and which refresh and cool the skin and render it clean and healthy. Some of these form a lather like soap, but exercise no such injurious effect as soap.

A REPUTED YELLOW-FEVER SERUM.—It is reported that Dr. Felipe Caldas, a Brazilian bacteriologist who claims the discovery of a yellow-fever serum, has gone to Cuba to conduct experiments. He will first visit Santiago, where the fever is now prevalent.—*Boston Medical and Surgical Journal*, August 1st, 1901.

Letters, Communications, &c., have been received from:—

- B.**—Dr. W. Leonard Braddon (Malay Peninsula); Dr. Blayney (Manchester); Dr. A. Boddaert (Ghent).
C.—Dr. Cousland (Swatow); Dr. A. Caccini (Rome).
D.—Dr. A. Dalgetty (Madabpore); Surg. Lt.-Col. S. H. Dantra (Burmah).
G.—Dr. Grassi (Rome).
H.—Dr. A. H. Hanley (Dublin); Staff Surg. P. Handy-side, R.N. (Esquimalt); Dr. Hewlett (Trinidad).
M.—Dr. J. T. Moore (Texas); Dr. W. A. Mackay (Spain); Dr. Murray (Fiji); Dr. Milton (Cairo).
R.—Dr. John Roche (Gold Coast).
S.—Dr. Sandwith (Cairo).
T.—Surg. J. Marles Thomas, R.N. (Zambesi River).

EXCHANGES.

Annali di Medicina Navale.
 Archiv für Schiffs u. Tropen Hygiene.
 Archives de Medicine Navale.
 Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
 Australasian Medical Gazette.
 Boletín de Medicina Naval.
 Boston Medical and Surgical Journal.
 Bristol Medico-Chirurgical Journal.
 British and Colonial Druggist.
 British Journal of Dermatology.
 British Medical Journal.
 Brooklyn Medical Journal.
 Climate.
 Clinical Journal.
 Clinical Review.
 Giornale Medico del R. Esercito.
 Hongkong Telegraph.

Il Policlinico.
 Indian Engineering.
 Indian Medical Gazette.
 Indian Medical Record.
 Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.
 Journal of the American Medical Association.
 La Grèce Médicale.
 Lancet.
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 Medical Missionary Journal.
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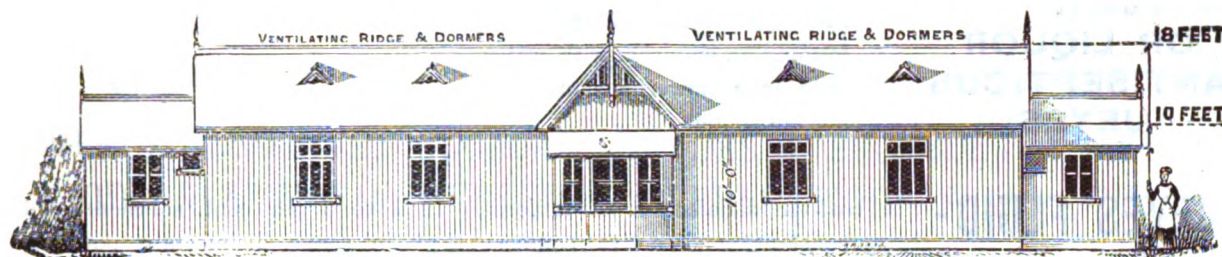
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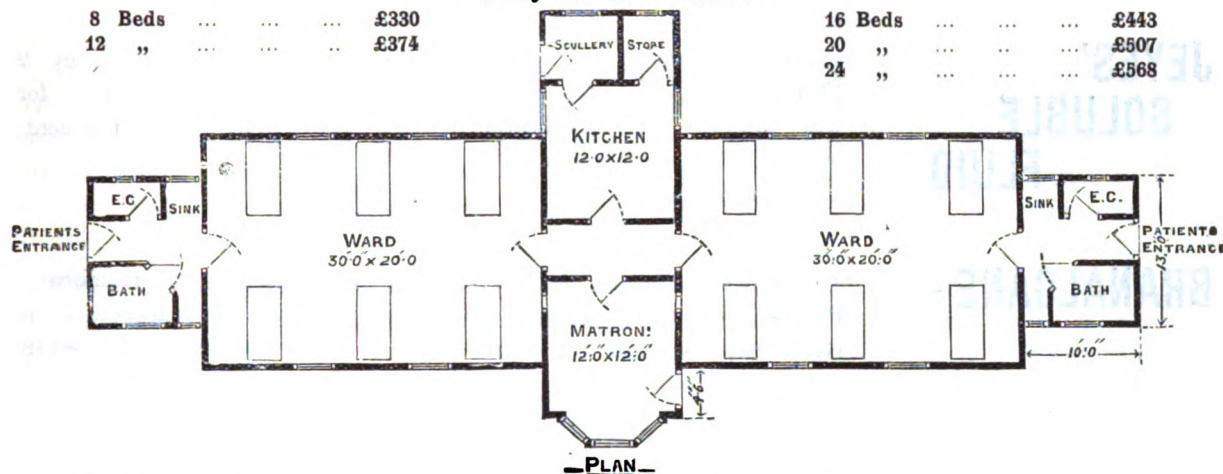


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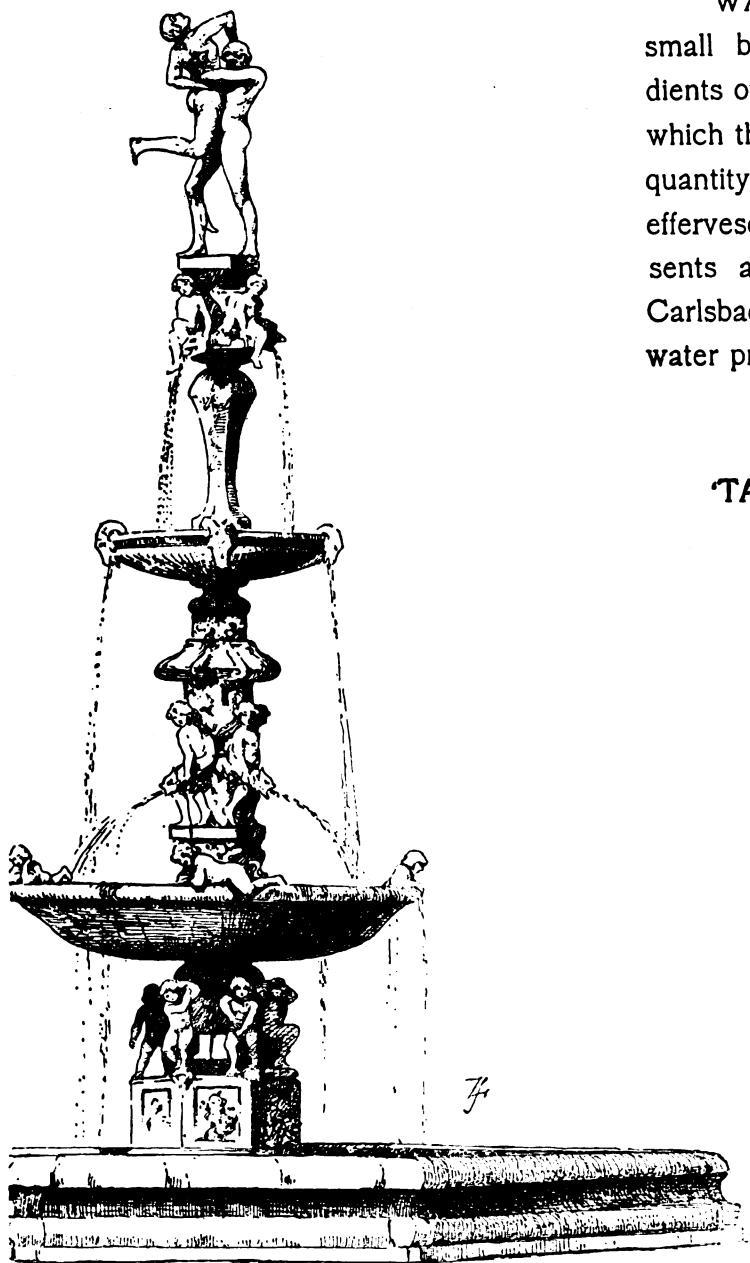
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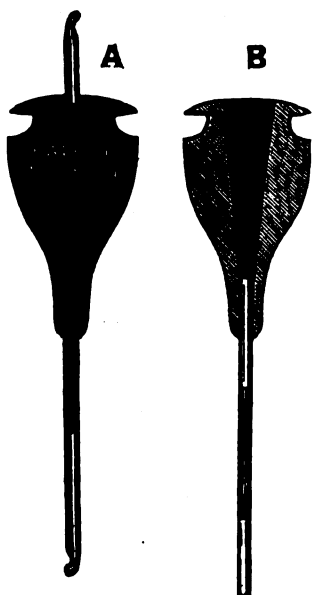
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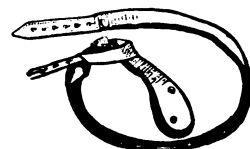
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By J. PRESTON MAXWELL, M.B., B.S., F.R.C.S.
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THE importance of a thorough knowledge of the intestinal parasites, by the man who practises in the East, cannot be over estimated.

A routine examination of the stools of one's patients would in many cases prove a veritable revelation. On the other hand the writer considers the subject is by no means unattended with difficulty. In the course of a short experience he has found that whereas the diagnosis of the common ova, such as those of *ascaris lumbricoides* and *ankylostomum duodenale*, are usually clear, yet atypical forms are not infrequently met with and may prove as yet difficult of diagnosis. Fortunately in the case of *ankylostomum duodenale*, the ova are so distinct that there is no difficulty in determining quickly and certainly whether they are present or not.

In visiting a colleague's hospital lately, the writer was able to prove to his friend's complete satisfaction that three old patients, who had been treated for weeks for malarial cachexia, were really pure and uncomplicated cases of ankylostomiasis. And it is his opinion that a great many of the obscure so-called "malarial cachexias" of this sub-tropical region will turn out on fuller examination to be cases of ankylostomiasis.

In this region there are three classes of patients infected with this parasite :—

(a) Those in whom it is the sole disease, and whose anæmia is due to the pernicious action of the parasite, viz., *uncomplicated cases*.

(b) Those in whom it is one of several factors in bringing about a state of debility and anæmia, viz., *complicated cases*.

(c) Those in whom, *as far as one can judge*, the presence of the parasite causes but little trouble, and would not be suspected were it not found on casual examination of the stools, viz., *incidental cases*.

Those the writer would place in the *first class* are cases of severe anæmia, in whose stools are many *ankylostomum ova*, who have not suffered from recent malaria or acute specific fever, who are not opium smokers, whose spleen cannot be palpated, and in whom there is not a profound round worm infection. Of course the subjects of tubercular phthisis, Bright's disease and the like, are excluded.

In the *second class* he would place those who are suffering from a serious ankylostomiasis infection, but in whom there is, in addition, an enlarged malarial spleen, active malarial infection, or one of the other diseases mentioned immediately above.

In the *third class* fall the large majority of those in whose stools the ova are found. This class are not suffering from anæmia, the infection is very slight, as shown by the number of ova, and there are practically no symptoms. This must not be taken as evidence that it is innocuous in these cases, as there is no proof on the point.

Ætiology.—As far as the writer has been able to observe, the cases occur mostly among agriculturalists, and among strong, healthy men of middle age or rather younger. Considering the Chinese habit of using fæces and urine, both in the fresh condition, for watering vegetables, and after storage for manuring fields; and considering that it is not an uncommon thing to see a field worker take the filthy water from the edge of these same fields, and either drink it or wash his mouth out with it, there is one good road open whereby infection *may* occur. So far I have only been able to trace the exit of the embryo from the ovum, which occurs rapidly after the fæces have been voided. The description of the parasite (male and female) and the ovum given in the usual textbooks are perfectly sufficient for identification, and with care the parasites are easily found. It is best to

mix the faeces with water and then pass them through a fine wire sieve.

Diagnosis.—The patient, affected with pure ankylostomum infection, does not, as far as the writer is aware, present any absolute diagnostic appearance, but this much may be said, he is *not* wasted, but looks rather like a strong healthy young man who has had the colour taken out of his face and replaced by a sallow earthy tinge. From pernicious anæmia, which resembles it mostly in outward appearance, it may be distinguished by an examination of the blood, combined with the presence of ova in the stools. The main distinction is that poikilocytosis, if it occurs at all in ankylostomiasis, is not a marked feature; it has not occurred in any of the cases on which this paper is based, although, as may be seen by the blood counts given below, the condition of anæmia may be extreme:—

Case 1.—Aged 26. Red corpuscles, 2,050,000. H., 20 per cent.

Case 2.—Aged 32. Red corpuscles, 1,500,000. H., 15 per cent.

Thoma-Zeiss hæmocytometer and Von Fleischl's hæmometer used.

There is no marked leucocytosis, and in all the cases seen of this class no enlargement of spleen or lymphatic glands. There is no sign of disease in other parts of the body. As a rule the urine is free from albumen, and this may be the case even when a condition of extreme anæmia with breathlessness and œdema of the legs has been reached. In other cases there may be a faint trace, but only when the anæmia is extreme.

The stools in the cases on which this paper is based were not specially foul, and contained numbers of the typical ova. Blood has not been a marked feature in them, a trace occurring now and then. Their colour is often brown tending to leaden grey. Diarrhœa slight in amount is very common in these cases, and dyspeptic symptoms are common. Headache is sometimes met with; as to the appetite, sometimes it is ravenous, but very often the opposite. This may be accounted for by the fact that the majority of these cases do not come to hospital till they are very bad, and in some, they have been progressively getting worse for the last four or five years.

Many of the cases have no rise of temperature at all, and in some cases the morning reading may run for days as low as 96.5° or 97°. Other cases have a slightly raised irregular temperature.

In the *complicated cases* the diagnosis rests on the discovery of numbers of ova in the stools, and very often this is discovered during the revision of a case of, say, malarial anæmia, which without any obvious adequate cause is not improving under treatment.

The diagnosis in the incidental cases rests on the accidental discovery in the stools of a few ova.

Treatment and Prognosis.—In fairly early cases under appropriate treatment the prognosis is very good, but when one gets a case reduced to the last extremity it is very difficult to say what will be the ultimate result. Granted that you have conquered the parasite, your patient has a long period of convalescence before him, during which, in his weakened condition, he is liable to fall a victim to a severe attack

of æstivo-autumnal fever or the like. The chances of the patient very largely depend on the degree of anæmia, the presence or absence of complications, and his willingness to place himself for a long time under treatment. Too often, having improved a little, the native thinks he can leave hospital and do a little work, thereby greatly lessening his chances.

As to drug treatment, the writer always begins with *santonin* to clear out the round worm, followed by a sharp purgative.

As the cases he has to deal with are mostly much reduced, *thymol* (gr. x.) is given every second night for three or four times, on each occasion being followed by castor oil in the morning. But although this brings away the ankylostomes, it does so slowly, and in his opinion a specific easier of administration and causing less depression would be a great boon. At present he has under his care a patient who has been under treatment in hospital for a month, has been repeatedly dosed with *thymol* (gr. x.—gr. xx.), and whose faeces still contain numbers of ova.

Much attention must be paid to the diet. This should be rich and at the same time easily digested, and in tropical countries the combination of quinine with the iron, which is of course to be prescribed, is a great advantage.

THE GEOGRAPHICAL DISTRIBUTION OF BILHARZIA.

By W. G. TOTTENHAM POSNETT, F.R.C.S.I.

No. 8 General Hospital, Bloemfontein.

THE occurrence of two cases of bilharzic hæmaturia having been admitted to my wards in this hospital during the last few months has led me to believe that the geographical distribution of this parasite is of a much greater extent than is generally supposed.

Manson in his book on "Tropical Diseases" says it is found in Natal, Mauritius, the Gold Coast, in Tunis, "and it probably exists in many other parts of Africa." This surmise is borne out by the paper by Dr. Daniels in the JOURNAL OF TROPICAL MEDICINE of June 15, 1901, in which he says "Bilharzia as a cause of hæmaturia is common in all districts" (British Central Africa). The following notes will, I think, add still further strength to Dr. Manson's conjecture.

Case 1.—Pte. W., 2nd Worcesters, aged 24 years, was admitted to No. 8 General Hospital, June 16th, 1901, complaining of passing blood in his urine. He first noticed it a month before admission. He has been in South Africa nine months. His movements have been as follows: three weeks in Durban, Natal; then trekked through the Tugela district into the Transvaal; was trekking about the Koomati Poort and Lydenburg districts for four months; then marched to Pretoria, where he remained six weeks; then went to Kroonstadt in the Orange River Colony, where he remained until he was sent down to Bloemfontein.

He states that the last two or three drops of urine voided consists of bright coloured blood. He has to get up once or twice at night, micturition normal in frequency during the day. There is a burning sensation at the meatus and root of the penis after urina-

tion. There is a dull pain over pubes when the bladder gets full. He has slight chronic cystitis. Microscopically, ova of bilharzia hæmatobia are present in the urine in small numbers.

Case 2.—Pte. C., 1st Oxforas, aged 22½ years. Landed at Cape Town in January, 1900, and took part in the general advance under Lord Roberts, which ended in the capture of Pretoria. He then marched to the Crocodile (Limpopo) River and remained in the Magariburg district for only five days. He was then sent to the Orange River Colony, about which he trekked for four months; then to the Klerksdorp district of the Transvaal, where he remained until he contracted enteric after two months in that locality. He was sent to hospital in Pretoria January 24th, 1901, and discharged to duty April 30th. He noticed blood in his urine for the first time in the latter part of May, but did not take much notice of it for a month, when he went sick and attended the hospital. He was sent to No. 8 general hospital August 13th. He complains of passing blood in his urine, the last few drops being almost pure blood. He has a dull pain in his back, also at meatus and base of penis, which is worse after urination. Some nights he has not to get up, but if he has drunk much liquid in the evening, the same night he has to be up two or three times. He has noticed that there is considerably more blood if he has had a hard day's ride, especially if he could not get sufficient to drink. The microscope shows that the urine contains bilharzia ova.

The above cases, I think, prove that this disease has a wider distribution than is generally considered. It was only a few weeks before case 1 was admitted that a microscope was supplied to the hospital, and I remember several cases that were diagnosed "hæmaturia," which, I do not doubt, would have proved to be the disease under consideration had a microscope been available. I do not consider that I am far wrong when I state that 80 per cent. of the cases of so-called "hæmaturia" that have occurred among the troops during this campaign have been due to bilharzia.

It is not surprising that a large number of cases should occur when we consider that the thirsty troops after a hard march, in the great majority of cases, have nothing to drink but the water contained in the dams of farms, or a "water hole."

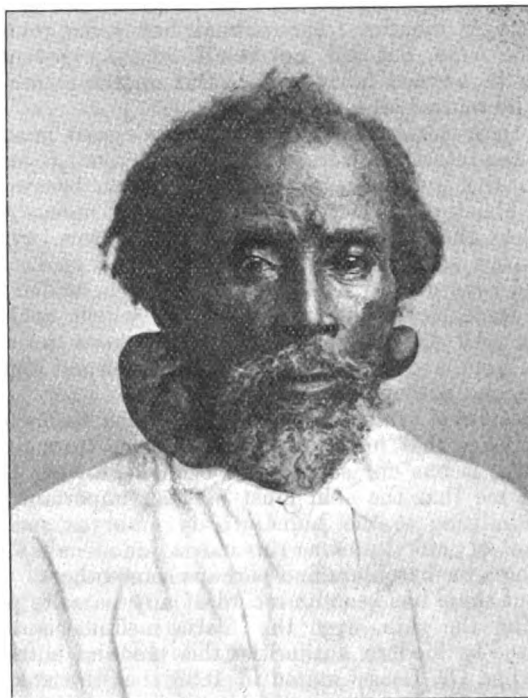
It is very probable that we will find that this parasite is distributed throughout the African continent.

NOTES ON CASE OF FIBROMATA.

By J. H. HUGH HARRISON.
Assistant Colonel-Surgeon, Belize, B.H.

N. M., aged 55, a black Spaniard from Truxillio, S. Honduras, was admitted into hospital suffering from multiple fibromata, three of which are visible in the photograph. Two were connected with the lobules of the ears. The patient stated that eight years ago he noticed a swelling at the back of the lobule of this right ear, which gradually became larger and spread to his neck; later a similar swelling appeared in his left ear, but this was confined entirely to the lobule.

When admitted the tumour was found extending from the back of the lobule of the ear to the neck by a thin skin pedicle for about three inches. The left tumour, about one-third of the size of the right one, was confined entirely to the back of the lobule, which it dragged, owing to its weight, considerably downwards.



FIBROMATA OF THE EAR LOBULES.

I operated without an anæsthetic and removed both at one sitting; healing was by first intention. Right tumour weighed 18½ ozs.; left 6½ ozs. Examined microscopically I found them to be entirely fibrous.

NOTE ON THE ENTRANCE OF ANKYLOSTOMA EMBRYOS INTO THE HUMAN BODY BY MEANS OF THE SKIN.

Read at the British Medical Association Meeting, 1901.

By F. M. SANDWITH, M.D., F.R.C.P.
Professor of Medicine and Senior Physician to Kasr-el-Aini Hospital, Cairo.

It has long been assumed that the chief mode of ankylostomiasis infection in the various countries from which the disease has been reported is by the mouth while eating or drinking. Dirty hands, muddy feet, and unwashed vegetables are daily factors in the peasant's life, and are probably responsible for much of the infection.

It is more difficult to see how drinking even muddy water can communicate the disease, for we find experimentally that running water kills the larvæ, while in stagnant pools or wells they soon sink to the bottom, and therefore can only be drunk if the

water be stirred up. Dr. Looss finds in Cairo that in summer the larvæ are fairly active, but in the cool weather they sink to the bottom in half an hour. As an instance, however, of acute ankylostomiasis infection by the stomach I may recall an experiment carried out at the Cairo Medical School. The larvæ of an analogous worm, *Trigonocephalum ankylostomum*, were administered in milk to a healthy dog, aged four months. The animal had some retching at the time, but did not vomit, and for seventeen days he seemed fairly well. But on the eighteenth day he refused all food and died.

A *post-mortem* examination showed great anæmia, and the intestines were white, except about 8 inches from the pylorus, where they began to be swollen and bluish-red. Here bathed in bloody mucus were no less than 7,179 young immature worms, with a very few scattered above and below this spot. The blood was due to capillary hæmorrhage, which was not traceable to the very few bites which could be seen. All the ankylostoma embryos were the same size, from 6 to 7 millimetres long, of normal appearance, and without sexual organs.

In spite of evidence such as this, which seems quite conclusive that infection can take place through the mouth, it has for some years been a growing belief with me that the skin must play an important part in admitting to the human body embryos such as those of ankylostoma (*uncinaria duodenalis*) and distoma hæmatobium and perhaps some others.

But there has been no record of any parasite penetrating the skin, even the *filaria medinensis* being refused by modern authorities this mode of entrance, so when Dr. Looss¹ stated in 1898 that the ankylostoma embryos entered the human body by the skin as well as by the alimentary canal, his statement met with only hostile criticism. He decided to write nothing more on the subject until he was able to definitely prove the fact, and the chief object of this communication is to call the attention of the members of the Tropical Section to his interesting discovery.²

Like many another this discovery was made by pure accident. On one occasion, while working in his laboratory, a drop of water containing more than 1,000 lively larvæ of the ankylostoma duodenale happened to fall on the cleft between two fingers of Dr. Looss's left hand. He was surprised to find that this was followed by redness and burning at the spot, and he wondered if this could be caused by the larvæ. He therefore allowed another drop to fall upon another part of his hand, and this was again followed by a burning sensation and redness, while examination of the drop of fluid on his hand some minutes later showed countless empty embryo sheaths and a few sluggish embryos.

Most of the larvæ had evidently entered the skin, leaving their sheaths behind. Dr. Looss thereupon found himself reinfected with the worms; eggs reappeared in his fæces, debility and anæmia followed,

requiring a prolonged cure of thymol. Both he and I then became convinced that this method of infection probably accounted for previous attacks of the disease for which I had had to treat him. For the last seven months he has continued to handle similar cultures of active embryos, but no reinfection has occurred since he has taken the precaution of washing his hands with 90 per cent. alcohol.

The experiment upon Dr. Looss is not convincing, because he had, as I have said, previously suffered from the presence of ankylostoma in his intestines.

He next experimented upon a piece of skin removed from a fresh human corpse, and warmed to 99° F.; but this did not show any entry of embryos, possibly because the skin at once became too shrivelled up.

The next attempt was more successful. It was made upon the leg of a boy, aged 13 years, one hour before the limb was amputated. The leg was thoroughly washed with soap, nail brush, and water, then dried; and then one drop of water containing many larvæ was dropped on the skin and left to itself without being rubbed in. The drop spread out and dried up in ten minutes, and produced no redness of skin. The patient was not asked whether he felt a burning sensation.

One hour after the drop came in contact with the leg the limb was amputated, and the suspected skin was at once removed from it and spread out with pins, gradually hardened in alcohol, and then embedded for section cutting. The sections when examined showed that the larvæ had entered the skin principally by the hair follicles. So far as the drop had spread there was hardly a hair follicle free from young ankylostoma.

In some there were single embryos, in others there were masses. In several cases the larvæ were seen in different stages of entry, the tail still outside, whilst the head had pushed itself between the hair and the neighbouring epidermal layer of the hair follicle. Some of the sections were unfortunately broken in preparing the photomicrographs, of which I now show you copies, but I have here one of Dr. Looss's sections under a microscope.

The progress of the larvæ seems to be as follows:—When once inside the hair follicle they push their way towards the hair papilla, during which process, if there are many of them, the root sheaths of the hair are almost completely destroyed. When they get to the hair papilla they leave it to pierce the surrounding tissue of the true skin.

Until they enter the hair follicle they have no purchase for their tails, but having once entered, they progress by their own boring action and the side resistance offered to their propelling tails. It must be remembered that the hair follicle is a recess of the corium sunk below the general surface of the skin, and that the hair papilla is a cutaneous papilla rising up in the bottom of the follicle. The embryo, therefore, takes a very practical way of forcing himself into the subcutaneous tissue. He never seems to penetrate into the ducts of the sebaceous glands nor into the sweat glands. Although the hair follicle seems to be the chief gate of entry, there are very likely other methods by which larvæ under other

¹ *Centralblatt für Bakteriologie, Parasitenkunde und Infektionskrankheiten*, Bd. xxiv, p. 483.

² *Ibid.*, May 31st, 1901, for paper, and July 5th, 1901, for photographs.

circumstances penetrate the skin. For instance, in Lower Egypt, during the spring and autumn the dorsal aspects of the hands and feet of many of the peasants are blistered by pellagrous erythema, which may help the embryos to enter. This may possibly account for the fact that so many of our hospital patients suffer from the two diseases, pellagra and ankylostomiasis.

The Egyptian peasant works all day with his naked feet, legs, and hands exposed to a coating of mud, mixed with water containing ankylostoma embryos which have sprung from the eggs contained in the faeces of infected natives. Latrines are unknown in the country villages and every man eases himself whenever and wherever he thinks fit. The entrance of embryos of the ankylostoma into the human skin affects many countries besides Egypt, and may account for some of the infection reported from India, the Italian rice fields, St. Gothard tunnellers, and mine labourers in Southern Europe where men work with bare feet in infected mud and water.

I hope that we shall be able for some years to retain Dr. Looss in Cairo, and that he may be able by this discovery to throw some light on the vexed question of how boys and girls in some countries become the victims of bilharziosis, and other parasitic diseases.

With regard to ankylostomiasis there is, of course, as yet no proof that the embryos can work their way from the subcutaneous tissue to the duodenum or jejunum. That can only be proved by future experiments upon individuals who are certainly free from ankylostomiasis infection, and preferably upon those who have never had any chance of becoming infected.

INFLUENCE OF COLOUR ON MOSQUITOES.

By OSBORNE BROWNE, M.B.

In consideration of Dr. Nuttall's valuable paper on "The Influence of Colour upon Anopheles," *British Medical Journal*, September 14th, 1901, pp. 668-669, I venture to give a small experience while I was in the Gold Coast.

I was accustomed to lie down at midday, not to sleep, but to rest; and often I was greatly annoyed by two or three most persistent culices (usually *teniatus*). The moment I rose they left me, but as soon as I again reclined they renewed their attacks. I sought about for them to see where they retired, and was surprised to find that it was the black bars of the bedstead that was their retreat.

In view of this fact, I think it would be well not only to paint the inside of one's house of a suitable colour, but to have light-coloured furniture, cushions, &c., and to have the bed painted white or yellow. For this purpose I intend taking out with me some enamel paint and a brush.

The administration of quinine daily is attended with serious drawbacks in the shape of dyspepsia, nervous irritability, &c.; and we must not forget that it is an unnatural constituent of our bodies, and is therefore poisonous. Therefore it behoves us

to use all the means in our power to destroy mosquitoes, and prevent them breeding and invading our houses.

It is attention to details that will ensure success in this, as in any other sort of warfare, such as gauzing the windows and doors, or closing house before sundown; opening house to let sunlight and fresh air flush it out during the day; daily brushing of ceilings, walls, behind presses, under tables, &c.; putting all dark clothes away; kerosining the tank; sanding the yard; removing cans, bottles, cocoa-nut husks, &c.; keeping natives at a distance; painting or white-washing the house white; free use of a good net hung within the poles, thrown up during the day, and PERSONALLY tucked under the mattress before retiring; use of closely woven, hard, and light-coloured clothes; and wearing white blanched boots and suitable socks; being particularly careful when visiting or travelling; and avoiding late dinners with friends.

Personally, I do not believe in the upturning of earth, freeing resting spores. I have stood daily for a long time on the top of upturned earth beside what has been termed one of the most pestilential lagoons on the West Coast, superintending the building of a dyke, and I never enjoyed better health. Other factors have to be considered when men say they have caught fever from upturned earth.

I have kept my child from the time he was born in one of the death traps of West Africa until we went on furlough, when he was 10 months old, without his having been bitten by a single fly or having the slightest fever. In fact, the little chap developed well and weighed about 22 lbs. when we left. He will return with me, and I propose to keep him as free from fever as before. He has never had a grain of quinine. This compares well with the great majority of native children who come to be treated with enormous spleens and wizened faces, in which the dark skin cannot hide the marked pallor.

A CASE OF HEPATIC ABSCESS, PROBABLY SUPRAHEPATIC, TREATED BY TAPPING WITH TROCAR AND CANNULA—RECOVERY.

By G. M. O.

West Indies.

LUIZ DE FRIETAS, aged 30, thin and sallow, consulted me at an Estate Hospital in November, 1898, for fever and pain in the abdomen, more especially the hepatic region, which he ascribed to the results of a fall which he had some time previously.

I examined him and found both liver and spleen enlarged; the liver had a hardish feeling. As he owned to having taken much alcohol in his earlier life (he had given up doing so for some years) I thought cirrhosis was commencing. However, I treated him for malarial fever with colic, and he was relieved. A few weeks later I was called to see him at his home, and found the liver more enlarged and very much harder. He had never suffered from dysentery. The spleen was still enlarged. I gave him calomel and jalapine, followed by castor oil and then quinine, which re-

lieved him. I did not see him again till February, 1899, when I was again called to his house; I found him suffering much. The whole of the hepatic region was of a stony hardness, the bases of both lungs were dull, and no air was entering. In front there was tendency to pointing, and at this spot I aspirated, using a long four-inch needle, which was inserted with difficulty owing to the extreme hardness of the tissue; and it was only when pressed in that a small amount of grey pus was obtained. I came to the conclusion that the pus had not the character of hepatic abscess pus, and that it might be a suprahepatic abscess.

The question then arose, whether or not, to tap from the back. I believe it would have been wiser to tap from there, but having obtained pus from the front, I decided to tap therefrom with a long hydrocele trocar. The difficulty was great, it was like boring through a piece of board, and when at last it went suddenly into some cavity, fully five inches distant from the anterior puncture, I almost feared to remove it, but on doing so, the same thick grey matter oozed out of the cannula, which was left in until the following day; carbolic lotion, 1 to 40, being freely injected, a small drainage tube replacing the cannula. This was continued for a week, when I decided on a second operation with a large ascitic trocar. This proved thoroughly successful; half a gallon of fetid pus was evacuated at once. I had not then read Manson's account of operation for hepatic abscess, and had no suitable instruments, hence I had no little difficulty in introducing a $\frac{1}{4}$ inch drainage tube through the cannula, but at last succeeded by stretching it on an umbrella wire, having tied it over the top, and cut holes at the side. This was readily passed through the cannula when stretched, the cannula withdrawn over it; then on relieving the tension the wire was readily withdrawn, and the pus followed freely while it pressed firmly against the walls of the opening, and there was no hæmorrhage. The patient did well until being impatient of the slow healing and antiseptic injections, withdrew the piece of shortened tube, with the result that a reaccumulation of matter occurred, with great pain, accompanied by a cough. I decided on operating again, but before I could do so he began to cough up the same matter, showing that it had broken into the bronchi.

I performed the same operation again and continued antiseptic injections; put him on carbonate of guaiacol, creasote, and carbolic inhalations. In a few days the purulent expectorations ceased, and he again steadily improved, and is now, August, 1901, thoroughly well, and has been for the last two years. The lung trouble has quite disappeared, and the liver is normal to percussion and palpation. I have no doubt that we had a case of suprahepatic abscess of traumatic origin to deal with, and in no sense connected with the liver, and the right treatment should, perhaps, have been to evacuate it from the back.

THE opening address of the Third Winter Session of the London School of Tropical Medicine will be delivered on Wednesday, October 16th, at 4 p.m., by Lord Brassey.

"THE VIABILITY OF THE BACILLUS PESTIS,"

By Dr. M. J. ROSENAU,

Of the U.S. Marine Hospital Service.

This brochure of 44 pages emanates from the hygienic laboratory of the Naval Hospital at Washington. The results obtained by Dr. Rosenau by means of his experiments are as follows:—

(1) The bacillus pestis is not a frail organism. It resembles the hæmorrhagic septicæmic group or the cocco-bacilli as far as its viability is concerned.

(2) Temperature is the most important factor in the viability of the plague bacillus. It keeps alive in the cold, under 19° C., a very long time. It dies quickly, especially when dried, at the body temperature, 37° C.

(3) Moisture favours the life of the bacillus pestis. It usually dies in a few days when dry, even in the presence of albuminous matter, provided the temperature is above 30°. It may keep alive and virulent when dry for months in the cold, under 19° C.

(4) Sunlight kills the organism within a few hours, provided the sun shines directly upon the organism and the temperature in the sun is over 30° C. The effect of sunlight is not very penetrating.

(5) The virulence of the bacillus pestis is often lost before its vegetability.

(6) It is unlikely that new dry merchandise would carry the infection. The organism usually dies in a few days on the surface of objects such as wood, sawdust, bone, paper, &c.

(7) Clothing and bedding can harbour the infection for a long time and may act as fomites. The bacillus lives for months when dry in albuminous media at temperatures under 20° C.

(8) Food products may carry the infection of plague. The bacillus lives a long time in milk, cheese, and butter. It usually dies quickly on the surface of fruits and prepared foods.

(9) The organism may live a long time in water, although plague is not a water-borne disease.

(10) The plague bacillus does not live long on paper, and first-class mail is therefore not apt to convey infection.

(11) The colder the climate the greater the danger of conveying the infection on fomites—clothing, bedding, food, merchandise, &c., and more extensive disinfection is required in such a climate in combating the disease than in tropical regions.

(12) The plague bacillus is destroyed by sulphur fumigation and by formaldehyde gas in the strengths in which these disinfectants are usually employed. The gases can only be depended upon as surface disinfectants. In disinfecting ships, warehouses, dwellings, and other places infested with rats, fleas, and vermin, sulphur is better than formaldehyde, because formaldehyde gas fails to kill the higher forms of animal life.

(13) A temperature of 70° C. continued a short time is invariably fatal for the plague bacillus. The ordinary antiseptics are all efficacious in their usual strength for nonspore-bearing organisms. Efficient surface disinfection may be accomplished by exposing objects all day to the direct sunshine on warm days. The temperature in the sun must be above 30° C.

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MISSION OF

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TO

TROPICAL AND OTHER COUNTRIES.

THE Committee of the Seamen's Hospital Society, on behalf of that Society and the London School of Tropical Medicine, have issued a circular with the above heading. The mission to be undertaken by Sir Francis Lovell is for the purpose of eliciting support and raising funds for the Committee of the Seamen's Hospital Society, so that they may continue and improve upon the good work they have so creditably begun in connection with the London School of Tropical Medicine.

The places set down in Sir Francis Lovell's programme include most of the best known cities and countries in the tropical and sub-

tropical portions of the Empire, and wherever British folk have settled in warm climates.

The several countries it is contemplated to visit are Egypt, Aden, Zanzibar, all the Presidencies and several of the States of India, Assam, Burmah, Ceylon, the Straits Settlements, Perak, Selangor, Negri Sembilan, Pahang, British North Borneo, Brunei, Sarawak, Siam, Labuan, Hong Kong, the treaty ports of China, Peking, Japan, Australia, Tasmania, New Zealand, Fiji, and finally Canada.

The work undertaken by Sir Francis Lovell, although in the highest degree philanthropic and commendable, cannot be regarded altogether as a pleasant task. It is more or less of a begging nature, requiring of the man who undertakes it to be thoroughly in earnest and in sympathy with the spirit of the work. This we know Sir Francis to be, and we are sure he will enlist sympathy in the cause he pleads. He needs not to apologise to those he has introductions to that he comes upon a begging expedition. He asks nothing for himself, he is exploiting no shady financial trust, but appeals for funds to fight illness, and to bring health where disease prevails. No man ever had a more humane cause to plead, nor can any one give to a more charitable work or one calculated to spread its blessings so universally and so directly.

The importance of the cause could have no greater testimony than the fact that Sir Francis Lovell is himself the advocate. After a life spent in the colonial service of his country, after having attained a position in which retirement would be honourable, he neglects the leisure which he has every right to expect and enjoy, and for the good of the profession to which he belongs, and the immediate benefit of his fellow creatures, sets forth upon a difficult task. He has become impressed with the necessity for young medical men being trained for the special form of practice incumbent upon them in warm climates, and with the possibility for good of the London School of Tropical Medicine. There is no man, woman, or child living in a warm climate, be they British or native, who is not directly affected by the cause which Sir Francis pleads. From

the Governor of a State to the humblest coolie, the well-being of all classes is directly benefited by the work of the London School of Tropical Medicine.

It is to be hoped the mission will be successful, and that a sum worthy of the cause and of the Empire will be realised. It is to be hoped that every resident in Greater Britain will have the opportunity of contributing either directly or indirectly to this fund, for it is at once his or her duty and privilege to do so. Medical men can help perhaps most of all, and were we to suggest a course for them to pursue, we would recommend that, in every town where Sir Francis is expected, a local committee be formed, whose duty it would be to receive him and advise him as to the best course to pursue.

This plan would lighten labour, hasten the journey, and by lessening expenses improve directly the profits. Where the cause is difficult to plead, entertainments of various kinds might be possible, and in various ways can every community have the claims of the mission brought before it. Medical men need have no hesitation in bringing forward this great cause to their fellow residents and neighbours. Never did a more humane or catholic mission leave the shores of Britain. It has for its purpose the well-being of the greater part of the human race, irrespective of creed, colour, or nationality. Nor are the benefits which must accrue visionary or remote, for recent investigations in tropical hygiene and pathology have shown us how direct and immediate are the results of investigations. Therefore let no one hesitate to help the special advocate being sent out by the Committee of the Seamen's Hospital Society, least of all medical men. Their advocacy should be no mere passive support, no apologetic introduction of Sir Francis to those amongst whom they live and practise, but it is their duty, and we are sure it will be their pleasure, to prepare the way for his coming and explain what his mission means.

Article for Discussion.

THE DANGER OF SUBCUTANEOUS INJECTION OF QUININE.

By R. M. TOWNSEND, M.D. Aberdeen.
Bulawayo, Rhodesia, South Africa.

I FIND it frequently stated in text-books and articles on "The Treatment of Malarial Fever," that the intramuscular injection of a solution of quinine is the most reliable method of treatment.

Now I should like to know whether abscesses and necroses of skin over the sites of injection are often met with?

I have had two rather troublesome cases lately, resulting from such treatment, even after the most careful sterilisation of syringe and solution, as well as of the skin by the sister in charge of the ward. One patient had frequent hypodermic injections of strychnine at the same time, as he was in a very weak condition, yet these injections showed no signs of inflammation whatever.

The solution of quinine used was that described by Benson* in Dr. Manson's "Tropical Diseases," as none of the more soluble salts could be obtained.

In one patient—a phthisical subject with gastrointestinal catarrh—two injections were given, and a slough the size of a shilling formed over each injection. In another a slough of the same size formed, and in addition he had two abscesses.

I should like to know what the experiences of others are, as mine has not been very encouraging.

REMARKS UPON THE DANGER OF SUBCUTANEOUS INJECTION OF QUININE.

In order to further enquiry on the subject brought forward by Dr. Townsend, namely, the

* Benson's method is referred to in Dr. Manson's book as follows:—

"Benson (*Trans. First Indian Med. Cong.*), speaking from an experience of 1,390 cases, says that the hypodermic injection of quinine is by far the most effectual, as well as economical, way of treating malarial fevers. He used the sulphate dissolved in water with the aid of hydrochloric acid, the strength of the solution being fifteen grains to the drachm; of this he injected twenty minims between the scapulae, or into the outer surface of the arm. In 614 consecutive cases so treated not a single untoward accident occurred, one injection usually sufficing."

untoward results of subcutaneous injection of quinine, I submit my own experiences.

Most of the practitioners who have traduced this method of treatment have been accused of carelessness and uncleanness, and their attempts at protest, or at calling attention to the formation of abscesses, have been thus silenced. This is a most unfair accusation, but up to the present it seems to have been most effectual in stifling discussion of the subject. The result, of being told that it is septic and therefore uncleanly manipulations that have brought about the necrosis of skin or caused subcutaneous abscess, has been that the person so accused has dropped the method of treatment and, for him, there the matter ends. If hypodermic methods of treating malaria by quinine are as effectual, simple, and beneficial as the enthusiasts of this line of treatment declare them to be, how is it that this plan of administration is not more often practised? I hope that every one who sees this article of Dr. Townsend's will record his experience in this matter whether for or against the hypodermic use of quinine. I was prejudiced against its use by seeing the results in the practice of other medical men. Whilst I resided in Hong Kong several persons (five or six) came to me with abscesses on the outer aspect of the left forearm. They all gave the same story, that they had been treated by a French physician practising in the French possessions in the "Far East," who employed subcutaneous injections of quinine for the treatment of malarial fever. The abscesses were most troublesome; they were much larger than those referred to by Dr. Townsend, measuring as a rule just over three inches in diameter, and as they were circular and the abscess penetrated deeply, even through the deep fascia, the severity of the ulceration may be imagined. The process of healing was slow, several months elapsed before the limb could be freely used, and the size and ungainliness of the scar caused a permanent disfigurement. It was by seeing these cases that I conceived a dislike to the subcutaneous injection of quinine, and except under very exceptional circumstances I gave it up.

JAMES CANTLIE.

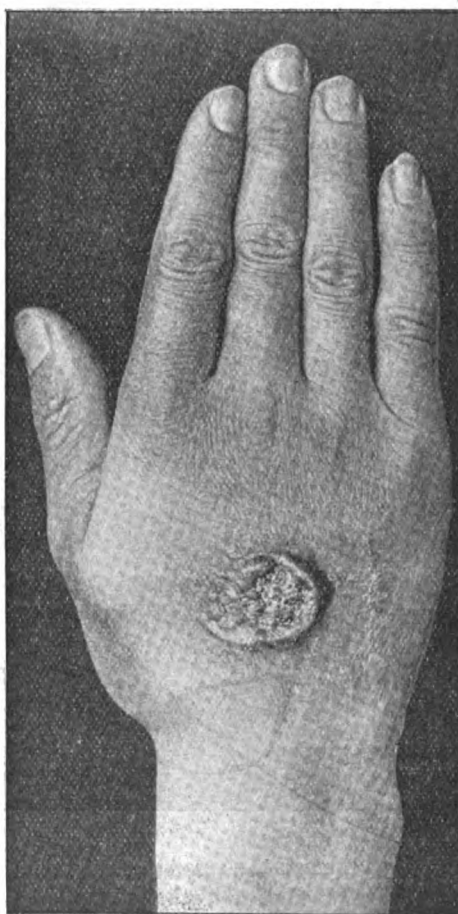
Translations.

A CASE OF FOREST YAWS (Pian bois).¹

By MM. DARIER AND DE CHRISTMAS.

(Translated from the French by P. Falcke.)

M. G., male, aged 32, has always had good health, with the exception of an attack of typhoid fever when he was twelve years old. He never had syphilis. He made three journeys into the interior of Guiana, in 1895-1896, in 1897-1898, and in 1900-1901. He had numerous attacks of malarial fever during his two first journeys, but they were less frequent during his third journey, thanks to the prophylactic use of quinine. Since his return to Europe he has had no more malarial attacks.



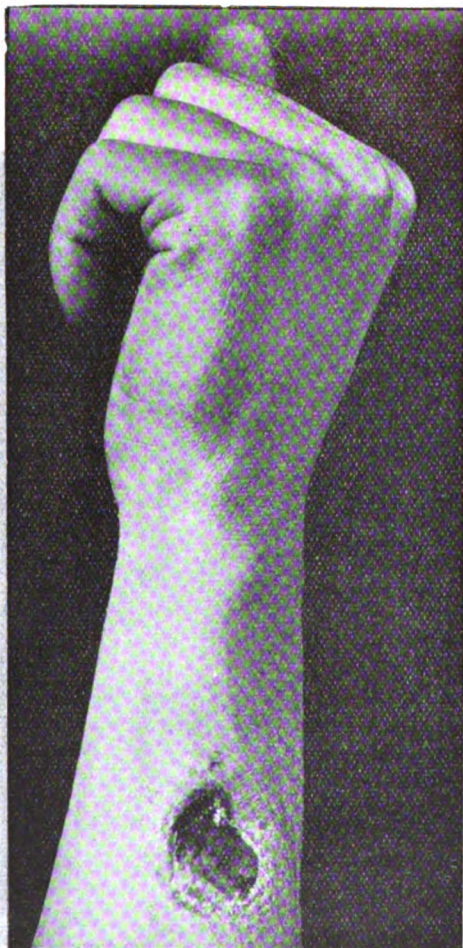
M. G.'s actual disease dates from the time he left the great forests of the interior of Guiana at the commencement of the rainy season (February 1st, 1901).

The commencement of the illness was announced by the appearance of a small node of a violet colour;

¹ The illustrations accompanying this article were made from a photograph by M. Meheux, and are reproduced in the JOURNAL OF TROPICAL MEDICINE by the kind courtesy of the Editor of *Le Caducée*.

it was non-ulcerative, slightly indurated, and had its seat on the back of the right hand. A short time afterwards a similar place developed on the left forearm. These excrescences began some days afterwards to ulcerate, and developed into two superficial ulcers about the size of a sixpenny piece.

On arrival at Cayenne, on March 1st, 1901, the ulcerations, slightly increased in size by then, were recognised as the lesions of forest yaws, a disease very common at the commencement of the rainy season amongst prospectors, the workers in clearings, and



foresters. The disease is quite unknown to Europeans who have never penetrated the virgin forests. In Dutch Guiana it is designated boussy-yassi.

The lesions were treated at Albina Hospital (Maroni), on March 19th, 1901, by means of curetting with the sharp spoon and the application of various antiseptics. The ulcer became still further enlarged under this treatment to the dimensions of a crown piece, while remaining atonic, in spite of cauterisations with nitrate of silver. In addition, other nodules, but not ulcerations, developed on both arms, as well as chains of small indurations along the course of the lymphatic vessels of both arms.

The patient adopted various methods of treatment,

such as prolonged sea baths, iodide of potassium (5 grs. per diem) &c., but without amelioration.

By the advice of a specialist at New York, the dressings of sublimate were changed for ichthyol, but with no better effect.

The treatment commenced in Paris on May 26th, 1901, consisted of the application of the actual cautery to the entire surface of the ulcerations and the daily application of our ointment of the following ingredients:—

Perchloride of iron	...	...	...	...	...	...	...
Vaseline	...	...	...	...	...	...	...
Lanoline	...	...	...	...	...	...	...

This treatment, renewed night and morning, caused the sores to heal quickly.

The general health of the patient is good. The blood examination exhibited no abnormality. The liver and spleen are of normal size. The constituents of the urine are normal.

The bacteriological examinations of the pus from the nodules, commenced in Paris a few days after the patient's arrival, have as yet yielded no specific results.

Some tissue removed by tweezers has been examined by M. Darrier from a histological point of view, but the result of this examination has been negative.

Cultures and inoculations on animals made by M. de Christmas remained sterile. At the present time all the ulcerations are healed. Along the lymphatic vessels there are still some nodules, but they do not exhibit the slightest tendency to ulceration.—*Le Caducée*, August 3rd, 1901.

UGANDA PROTECTORATE—REPORT FOR THE YEAR ENDING DECEMBER 31, 1900.

By Dr. R. U. MOFFAT, C.M.G.
Principal Medical Officer.

(ABSTRACT.)

PRELIMINARY OBSERVATIONS.

THE Uganda Protectorate includes a large tract of country, different parts of which differ entirely in their climatic conditions, varying from the cold and healthy altitudes of the Mau Escarpment to the hot and malarious shores of the Victoria Lake and Nile Valley.

The majority of our patients are natives in Government employ, who are not actually aborigines of the country; we are therefore dealing with people alien to the country.

Women and children seldom come under our notice, except at a few stations where there are settlements in which the wives and families of the men live.

For these reasons, I lay stress on the fact that the conclusions arrived at in this Report must be received with some reserve.

GENERAL HEALTH OF EUROPEANS.

Ten European officials have had to be invalided temporarily or permanently as follows:—

Three after recovery from blackwater fever; one for malarial neuritis and phthisis; one for rheumatism after nine months' residence in the country. The patient had suffered from the disease previously. One for appendicitis; one ulcer of the stomach; one suspected

phthisis after eight months' residence in the country; one debility following diarrhoea, complicated with piles and fissure; one anal fistula and debility.

There have been four deaths among the European officials:—

Two from blackwater fever; one suicide during blackwater fever; one killed in action.

Amongst the members of the different Missions there have been two deaths, both from blackwater fever.

SPECIFIC MEDICAL DISEASES.

(a) *Malaria*.—As has already been stated, malaria is endemic through the whole of the western portions of the Protectorate comprising the districts of the Lake level and the Nile Valley.

The types of fever commonly met with are the tropical quotidian and tertian, the latter more commonly among Europeans.

The benign tertian and quartan forms are seldom met with. The disease, if properly treated at the outset, even among Europeans, seldom assumes malignant features, except hæmoglobinuria.

Occasionally, among Europeans, the disease assumes a prolonged remittent and almost continuous course, but I have generally found that in these cases quinine had not been administered in proper doses at the beginning. For the most part, the common attacks in this country last for two, three, or four days. Personally, I am adopting the routine practice that if on the third day the temperature still shows a disposition to remain high, I at once exhibit quinine hypodermically. So far I have found that this invariably cuts short the attack.

BLACKWATER FEVER.

By far the most important and dangerous form of malaria is that complicated with hæmoglobinuria, the so-called blackwater fever. Previous to the year 1900 blackwater fever had almost been unknown in Uganda proper, while Unyoro was looked upon as a hot-bed of the disease. During the past year, however, quite a large number of cases have occurred in Uganda, but only one in Unyoro.

ONSET AND CLINICAL COURSE OF THE DISEASE.

The patient has generally been suffering from malaria more or less severely. Some morning, feeling better, or at any rate not bad enough (in his opinion) to warrant remaining in bed, he proceeds to get up and probably goes about his duties. A few hours after blackwater fever supervenes. With the onset of the hæmoglobinuria here is usually a severe shivering fit. Headache and pains in the back, severe and persistent vomiting, the ejected matter often being a slimy green stuff not unlike chewed grass, and suppression of urine.

The patient often becomes rapidly jaundiced, a symptom which I am inclined to look upon as a somewhat grave one. Three or four days is the usual duration of the disease, but it may be much shorter, or in rare cases much longer.

Prognosis.—The following number of cases have occurred during the year 1900, including the latter three months of 1899.

(a) European officials, fourteen cases with three deaths.

(b) Traders, two cases with no deaths.

(c) Missionaries, eleven cases with two deaths.

(d) Indians, fifteen cases with four deaths.

(e) Natives, one case with no death.

Treatment.—I am of opinion that quinine should be given speedily and in large doses. All the medical officers in the Protectorate, who have met with the disease, agree with me in this.

Owing to the severe vomiting it is generally impossible to give the quinine, and, in fact, any medicines by the mouth. In my experience rectal administration of the drug has not proved a success, but we have in intramuscular injection a safe and rapid method for introducing quinine into the system.

I will therefore shortly point out the method that should be followed. In the first place it should be remembered that it is not a hypodermic injection but an intramuscular one, and suitable sites should be chosen. My favourite position is the buttocks or the muscles between the shoulder blades. The arms and outer sides of the thigh are not good positions.

(1) Boil a syringeful of water in a test tube or spoon.

(2) Add the quinine, and, if any difficulty in dissolving, heat again. I avoid boiling the solution as for aught I know some decomposition of the drug may result. The solution should be perfectly clear before injecting it.

(3) Fill the syringe and affix the needle in the ordinary way. When ready dip the needle up to its base in pure carbolic acid and keep it there for a minute. Then, without wiping off the carbolic, plunge the needle in vertically, having first rubbed the sight with a little antiseptic lotion.

(4) Remove the needle quickly after injection, which should be performed slowly.

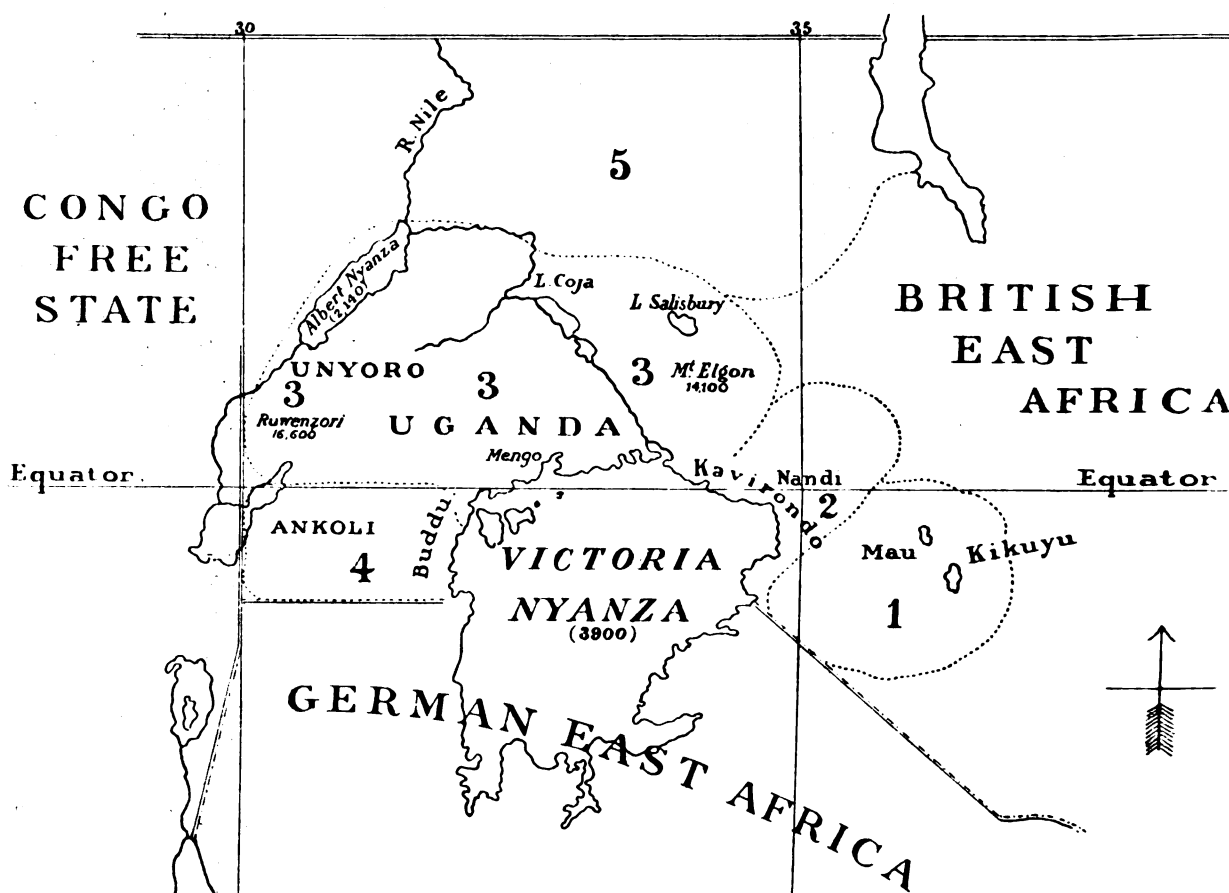
I use a large-sized syringe of 2 drachms capacity, and this will dissolve 25 grains of the hydrochlorate of quinine powder without any difficulty. In regard to further treatment the patient should be kept warm in bed. I recommend free drinking of barley water, rice water, soda, weak tea, and such-like bland liquids.

The vomiting persists even if the stomach is empty, when painful retchings result. For this reason also I think it wise to encourage the patient to drink as much as he can.

Small doses of morphia either hypodermically or by mouth at times seem to relieve the vomiting to a certain extent. No other drug has the slightest effect. The state of the heart has to be carefully watched and suitable stimulants, such as strychnine, should be given hypodermically.

Prophylaxis.—I am firmly of opinion that one single rule exists which, if followed, would prevent many cases of blackwater fever. No patient, especially if he has suffered much from malaria, or has been in the country for some time, should ever be allowed out of bed until his temperature is and has been normal for at least twenty-four hours. In my opinion it is the low temperatures which are most dangerous, and a chill acting at this stage will bring on hæmoglobinuria.

(b) *Measles*.—I have not come across this disease



DESCRIPTION OF THE DIFFERENT DISTRICTS INTO WHICH THE UGANDA PROTECTORATE MAY BE DIVIDED FROM THE POINT OF VIEW OF HEALTH.

1. *The Mau District.*—The country round is hot and dry, and the rainfall uncertain. The nights are bitterly cold, the elevation being 6,500 feet. A great feature of the Valley of Lake Naivasha is the strong wind, which almost invariably rises about nightfall. It rushes off the Kikuyu Escarpment (8,000 feet) from the east, and blows continuously until the early hours of the morning. The climate is healthy, and, as far as Europeans are concerned, there is little sickness. Malarial fever is, I think, not endemic.

Mosquitoes abound along the lake shore, but none of them, as far as my knowledge extends, belong to the genus *Anopheles*.

2. *The District of Nandi.*—It is in every way a magnificent tract of country, well watered, well wooded, and possessing a beautiful climate.

The days are warm, but never oppressively so, and the nights are bitterly cold. The elevation varies from 6,000 to 8,000 feet. Malaria does not exist, and, in my opinion, the country is one perfectly suitable for European colonisation.

3. *Districts of the Lake level.*—The general altitude is a little over 4,000 feet, and through all this district malaria is rife and mosquitoes abound. The shade temperature seldom exceeds 90° F. The nights are cool, with heavy drenching dew. The physical characters of the country in the eastern portion of the district differ entirely from those of the western.

The Kingdom of Uganda is a country consisting of a succession of small hills in the valleys between which papyrus swamps with sluggish stream flow slowly Lakewards. The vegetation is rank. Mosquitoes exist in myriads. Malaria is common at all times and seasons.

I have found a specimen of the *Anopheles*, but have not yet been able to trace their breeding haunts. Blackwater fever occurs throughout the whole district of the Lake level, but until this year was not common in Uganda itself.

In conclusion, I would say, in regard to the region of the Lake level, that, though no doubt highly malarious, it is not deadly, and in the future, with improved conditions of life and accommodation, Europeans should be able to live with little damage to their health.

4. *Districts of Ankoli and Toru.*—Both places have a good reputation as regard their healthiness, and no serious illness has been reported among the officials stationed there.

5. *The Districts of the Nile Valley.*—Under this term I include that part of the Valley of the Nile north of the Albert Lake; it is much hotter than Uganda, and there is no doubt it is even more malarious. Five cases of blackwater fever have occurred during the fourteen months ending December 31st, 1900, which is a high average considering the small number of Europeans resident there.

in the Uganda Protectorate, though it does, to my knowledge, occur nearer the coast line.

(c) *Small-pox*.—This disease is probably endemic all over equatorial Africa. At certain times it takes on epidemic features in some particular district, and from this tends to spread to others.

(d) *Chicken-pox*.—This is at times one of the commonest epidemic diseases met with in this country.

(e) *Mumps*.—A very common disease.

(f) *Dysentery*.—True dysentery is not a common complaint in the Uganda Protectorate now that the days of large caravans are over.

Many cases are returned in reports under this heading, but I am inclined to think that a large percentage belong to the mild catarrhal form, which is more in the nature of a simple diarrhoea with some blood in the motions.

(g) *Framboesia or yaws*.—The loathsome disease is exceedingly common in Uganda itself, and in the northern and western parts of the Protectorate. It has not been reported to me by any of the medical officers east of the lake, but I have seen one or two cases myself in Kavirondo. Hence, as it exists on the coast line, I am inclined to think that it is probably universal throughout East Africa.

(h) *Leprosy*.—I have met with a few cases of this disease, chiefly among the Soudanese; but I am unaware whether it exists to any great extent among the Waganda or other aboriginal tribes. The type most frequently seen is the anæsthetic and macular. In only one case have I observed the tubercular form of lesion.

(i) *Plague*.—I am unable to say with certainty whether this disease exists in Uganda. I have myself never come across it in any shape or form. It has been reported to me several times as being active in Buddu (south of Uganda), on the German frontier.

It appears that about ten years ago a virulent epidemic, called by the Waganda "*kaimpullæ*," swept through the whole of Uganda. From the accounts given to me by missionaries, it would appear to have been either bubonic plague or something like it. Since that time the Waganda ascribe the name of "*kaimpullæ*" to any disease which acts swiftly, and to them mysteriously, especially if it is fatal. I have on more than one occasion had patients brought to me as cases of *kaimpullæ*, but on examination they proved to be suffering from some other easily recognisable disease. I am therefore inclined to discredit the reports received from native sources.

It would appear, however, from researches and observations made by the Germans, that the plague bacillus does exist in their territory. It is therefore possible that the disease may be lingering in South Uganda in a subacute or chronic form, showing itself only in sporadic cases.

(j) *Beri-beri*.—I have not seen this disease in the Uganda Protectorate, though it occurs, I believe, on the coast.

(k) Enteric, cholera, scarlet fever, and diphtheria are, in my experience, unknown diseases in East Africa.

(l) *Influenza*.—An epidemic of this disease occurred in Uganda during the months of June, July and August, 1900. It also spread to Unyoro, but was not

reported elsewhere. Judging by native reports, it proved very fatal among the Waganda.

Diseases of the nervous system.—In my experience there is a singular absence of nervous diseases among the natives of this country. I have met with a few cases of *epilepsy*, but speaking generally, *insanity* is of rare occurrence. Among the Soudanese there is a sudden and temporary form of maniacal seizure, which they themselves call "seeing the devil." Under its influence a man will run "amok" in homicidal excitement. The following day he will be quite sane, and will profess entire ignorance in regard to his performances.

I have seen but few cases showing signs of gross nerve lesions. Paralysis of central origin due to emboli, thrombosis, or apoplexy, are of rare occurrence. One or two cases of hemiplegia, and one of paraplegia of syphilitic origin have come under my notice.

Facial paralysis is not an uncommon affection, especially as a sequela of malarial fever. The prognosis is good. One case of malarial peripheral neuritis occurred this year in a European, who was attacked by severe malaria within two months of his arrival in the country. The patient had also signs of phthisis, and he was at once invalidated.

Chorea is a disease I have not seen among the natives of this country.

Diseases of the respiratory organs.—Ordinary *colds* and *coughs* are excessively common, which, considering the habits of the people, is not surprising. Mild, dry *pleurisy* is also very frequently met with, but is easily curable by the ordinary treatment of a fly blister.

Pneumonia is a common complaint, and one which very often ends fatally among the natives.

Phthisis.—There have been a large number of cases of this disease among the garrisons (both civil and military) of the stations in the districts of Mau and Nandi.

I am not aware whether phthisis exists to any great extent among the Waganda. I have had this year three cases of the disease in Kampala, all of which proved fatal. The patients were all prisoners confined to the gaol in Kampala, and undergoing long terms of imprisonment.

The circulatory system.—In my experience diseases of the circulation are usually rare, but this may be due to the fact that the majority of our patients are strong, healthy men, in the prime of life.

As will be mentioned later *kidney* disease is rare, and, owing to all these reasons, it is not a matter for surprise that the circulatory system to a great extent escapes the diseases common among civilised people.

Organs of digestion.—Disorders of digestion and the alimentary system generally are the commonest affections which come under the notice of a medical man in this country, owing, of course, to the gross and filthy habits of the natives.

Chronic dyspepsia, gastritis, diarrhoea and colic are excessively common. Diseases of the liver are, on the other hand, somewhat rare. Mild congestion and hepatitis occasionally occur, but cirrhosis rarely. One case of biliary colic, due to passage of *gall stones*, was under my treatment this year, but it was the first

I had seen in the country. *Liver abscess* is not very common. I have had one case this year in a native, but no others have been reported. Constipation is a common complaint among Europeans, but natives are seldom troubled with it.

Sprue I have not met with.

Intestinal parasites abound, chiefly *Tenia saginata* and *Ascaris lumbricoides*. It would, I think, be within the mark to say that 75 per cent. of the population harbours one or other of these parasites.

Anchylostoma I have seen but once, and that several years ago. The patient was a Swahili and it is possible that he had contracted it elsewhere than in Uganda.

Spleen and blood.—Enlargements of the spleen, as would be expected, are very common. In making *post-mortem* examinations I have invariably found the spleen enlarged, whatever the disease may have been which killed the patient.

Most of the children and young people also suffer from enlargement of the organ, in some cases to an enormous degree. It is, of course, difficult to follow the course of such cases, and I am not aware what happens as the child grows to maturity. The enlarged spleen of leucocythemia I have not seen in this country.

Anæmia.—Simple anæmia is a common symptom both among the Europeans and natives.

Pernicious anæmia I cannot say that I have seen in this country.

Urinary organs.—Affections of these organs are most rare.

Organs of locomotion.—Rheumatism in the form of acute fever does not, I think, occur in this country. I saw one case (European) some years back, but the patient had only been two months in the country and he had suffered from the disease previously.

Acute localised arthritis as the result of injury or exposure to wet is not uncommon; also tenosynovitis and muscular rheumatic pains.

Rheumatoid arthritis as the result of injury or exposure to wet is not uncommon; also tenosynovitis and muscular rheumatic pains.

Rheumatoid arthritis is also occasionally met with. Gout is a disease I have not seen among the natives of East Africa.

Rickets is also in my experience an uncommon affection.

Skin diseases.—The two commonest recognisable diseases are eczemas of all kinds and a disease which I call itch, but which is certainly not due to the *Acarus Sarcotes hominis*. It is excessively common all over East Africa. One of my colleagues who has been on the West Coast informs me that it is, in his opinion, identical with the disease known there as *craw*.

Herpes of all kinds is not uncommon.

Pemphigus I have occasionally noted.

Psoriasis of a non-syphilitic nature I have never seen occur, and I have never recognised any of the different forms of tinea, though a case of tinea imbricata has been reported to me.

In regard to pediculi, only two are found, viz.: *P. vestimentorum* and *P. pubis*.

As far as I know, true *lupus* does not occur in this country. As is well known, the black races are par-

ticularly prone to the development of *keloid*, and many strange and fantastic examples of this condition are often seen, produced either by accident or design.

Leucoderma is also a common condition amongst the natives of East Africa generally. It appears to be progressive, but to produce no other obvious evil results.

The surgical part of Dr. Moffat's report will be dealt with in the next issue of the JOURNAL, and a summary in tabular form of the information conveyed.

Correspondence.

PREPONDERANCE OF FEMALE MOSQUITOES.

To the Editor of THE JOURNAL OF TROPICAL MEDICINE.

SIR,—There are one or two points connected with the life-history of mosquitoes which perhaps Mr. Theobald would be able to explain.

The first thing that strikes an investigator is the extraordinary preponderance of females. There does not appear to be one male in a thousand specimens. Could Mr. Theobald say what proportion of males and females are hatched; what becomes of all the males so quickly; and where impregnation takes place?

I am referring to the *Culex* genus chiefly, for in *Anopheles* there appears to be much less disproportion in the numbers of the sexes. Incidentally I may mention that I have found the following specimens of the genus *Anopheles* within the past two years:—*A. albitarsis* (F.), *A. funestus* (M.), *A. fuliginosus* (F.), *A. Rossii* (F.).

I am, yours truly,

Madabpore Tea Estate, A. B. DALGETTY, C.M., M.D.
South Sylhet, India.

A BERI-BERI EXPEDITION.

FOR some time it has been reported that an expedition to study Beri-beri was to be sent out by the London School of Tropical Medicine. It would now appear that the money necessary to defray the expenses of the expedition has been generously contributed by the Christmas Islands Phosphate Company, of Billiter Street, London, E.C. The sum of £1,000 has been granted by the Company and free passages to all the members of the expedition. Sir John Murray has also given a donation of £100 for the same purpose. The Colonial Office is stated to be prepared to make a grant in aid of this expedition. The members of the expedition are to sail from Cardiff on October 4th.

On referring to the map it will be noted that there are two Christmas Islands, both British possessions; one is situated in the Indian Ocean some 240 miles off the south coast of Java; the other belongs to the Central Polynesian Sporades in the Pacific Ocean. It is the group of islands off the Java coast that is the destination of those engaged in the Beri-beri expedition.

EXPERIMENTAL MALARIA: RECURRENCE AFTER NINE MONTHS.—Dr. Thurburn Manson, as a result of the bites of mosquitoes fed in Rome on a case of benign tertian ague, developed a double tertian fever. The first symptoms appeared after an incubation period of between ten and sixteen days. The illness lasted four days, when the presence of the parasite having been fully confirmed, ten grains of quinine were given. This drug was given from time to time for the next three months. Dr. Manson kept in normal health for nine months, when prodromal symptoms of illness developed, and a definite malarial paroxysm again occurred. This attack proved to be simple benign tertian malaria, the original infection being of the double tertian type.

Current Literature.

EPIDEMIC BALDNESS IN JAPAN.

DR. LOUIS ELKIND makes the following interesting communication about an epidemic of baldness which is at present affecting some parts of Japan. A large number of women have already suffered in this way; indeed, there was an epidemic of baldness at Chiba last year, and there has been an even more serious one quite recently at Osaka, the same province where, as it will be remembered, an extensive epidemic of plague which subsequently assumed a most formidable and alarming character, prevailed during the last months of 1899 and at the very beginning of 1900. The clinical course of the affection under consideration offers many points of interest, and differs eminently both as regards extent and character from the occurrence of sudden baldness, say, for instance, after enteric fever or any other acute feverish attack. For it is stated that during the epidemic of baldness, the loss of hair comes to women (and to men also) after very little if any premonitory warning. The scalp, to all appearances, may be quite healthy, and as far as external examination is concerned, no morbid signs can be detected, and there may be no symptoms either of actual illness or even of slight indisposition; but a woman may find when she combs her hair soon after rising in the morning that it falls out in remarkable quantities, and soon she is partly, if indeed not quite, bald. Or it may be that for some little time, as it has been observed in some of the more acute and severe cases, there have been disturbances of vision, a feeling of vertigo, diminished appetite and digestive troubles, though none of them are well defined or present any definite character; it may, however, be added that in some cases at least a slight rise of temperature has preceded the infliction. The effects of the disease exhibit several interesting peculiarities. The bald patches are irregularly spread over the head, but the first large one generally appears on the crown, and extends down the back of the head instead of forwards towards the forehead; thus it may happen that the back of the head is quite bald and the front covered with hair, the opposite of course to the baldness which is common in Europe. Then also men's beards are ravaged in a peculiar manner. The left cheek, for instance, may be completely deprived of hair while the rest of the beard is as usual and the moustache is left untouched, indeed the moustache is but rarely affected. Another point which may be noticed is that most of the victims of the epidemic are women, and more children are attacked than men. Strange to say, it is the men in the prime of life who suffer, not those who are advanced in years. The old men seem to be immune, for no case is reported of a man who had white or grey hair suffering any loss, and yet such is the eccentricity of the disease that fair men suffer much more than dark men, and dark women much more than their blonde sisters. The cause of this curious epidemic is very difficult to determine, indeed there is no really satisfactory explanation of it. Some of

the physicians think that the Europeans are affected by the climate, and others that the water is the cause of the trouble, whilst others again, incline to the belief that the disease is parasitic. Little wonder, therefore, that in view of this uncertainty the various methods of treatment, both preventive and curative, are unsatisfactory. There is an opportunity for a physician, native or foreign, to earn for himself great distinction.—*The Spectator*, August 24, 1901, p. 251.

LEPROSY.

TREATMENT OF LEPROSY.—Dr. de Moura, of Sao Paulo, Brazil, is using the venom of the rattlesnake in the treatment of leprosy. It is injected in gradually increasing doses and simultaneously an antitoxin serum is used. No results can as yet be given as the treatment has not been used for a time sufficient to ensure success or otherwise.

Dr. Dyer, of New Orleans, suggested the employment of Calmette's antivenene in the treatment of leprosy in 1897, and it has since been adopted in the laboratory of the Army of the U.S. at Manila.

ORGAN THERAPY IN CHINA.

DR. BOUFFARD, in an interesting article published in *Les Annales de Médecine Coloniale*, gives an idea of the general treatment of common ailments by means of organ therapy. The juice expressed from the lungs of pigs is given for chest complaints; the intestines of pigs for dysentery and diarrhoea; its brain for migraine. As the Chinese doctors have no knowledge of hypodermic injections all the remedies are given by the mouth. Their ignorance of anatomy also, causes them to neglect the use of certain active organs, such as the ovaries and the thyroid gland, but on the other hand, urine is taken internally in order to promote the circulation of the blood and to accelerate labour. The best remedy supposed to give strength to the parturient is to give her the placenta to eat, either in its natural state or dessicated and made into pills.

YELLOW FEVER.

ON July 5th, the Senate sitting in Paris adopted the suggestion to credit the Colonial Minister with 100,000 francs to be devoted to the organisation of a scientific mission having for its object the study of yellow fever.

THE PROPAGATION OF YELLOW FEVER.—In an address delivered at the Annual Meeting of the Medical and Chirurgical Faculty of the State of Maryland, and published in the *Medical Record*, August 10th, 1901, Walter Reid, M.D., Surgeon U.S. army, gives a detailed account of observations and experiments made in Cuba in connection with the propagation of yellow fever. A summary of the elaborate paper may be stated as follows: (1) Yellow fever is not communicable by fomites; thus persons sleeping in infected clothing within infected dwellings when protected from mosquitoes did not contract the disease. (2) Persons bitten by mosquitoes in an infected mosquito building, or by mosquitoes fed on patients suffering from yellow fever frequently (ten out of thirteen cases) developed the disease. (3) The subcutaneous injection of blood taken from the general

circulation of persons suffering from yellow fever produced yellow fever in the three cases experimented upon. The quantity of blood injected in these three cases was 1.5 cc., 0.5 cc., and 1 cc. respectively. (4) The production of yellow fever by subcutaneous injection is of much scientific interest—first, as serving to confirm what the mosquito inoculations had already shown, viz., that the parasite is present in the general circulation; second, that passage through the body of the mosquito, although this would seem to be nature's method, is not absolutely essential in the life history of this micro-organism; and third, that the period of incubation of the disease, when thus produced, corresponds fairly closely to that occasioned by the mosquito's bite. A point of considerable importance brought out by the blood injection was the absence from this blood, on careful bacteriologic culture, of any bacterium which grows on our ordinary media by aerobic methods; thus excluding absolutely the *bacillus icteroides* of Sanarelli from further claim as the specific agent of yellow fever.

CRUSADE AGAINST MALARIA AT CONCORD.—During the past few days Dr. Doty, health officer of the port, has begun an active crusade against malarial fever at Concord, borough of Richmond, in the vicinity of the quarantine station, where the disease prevails to a very large extent. A systematic inspection of individual homes is being made by a detail of policemen, with a view to correcting injurious conditions, and crude petroleum put in all the stagnant pools in the district. Dr. Doty is of the opinion that the mosquito larvæ remain at the bottom of the water most of the time, and he has designed a special apparatus to force the oil down to the bottom and spread it thoroughly there. The oil will naturally rise to the top later, so that he expects to accomplish all that is done by others in depositing it on the surface, and more, if possible. A careful investigation of the mosquitoes found in the region is also being made.—*Boston Medical and Surgical Journal*, August 8th, 1901.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Caducée.
Climate.
Clinical Journal.
Clinical Review.
Giornale Medico del R. Esercito.
Hongkong Telegraph.

Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
Public Health.
Revista de Medicina Tropical.
Revista Medica de S. Paulo.
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The Medical and Surgical Review.
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Extract from the British Medical Journal, Nov. 10th, 1900.

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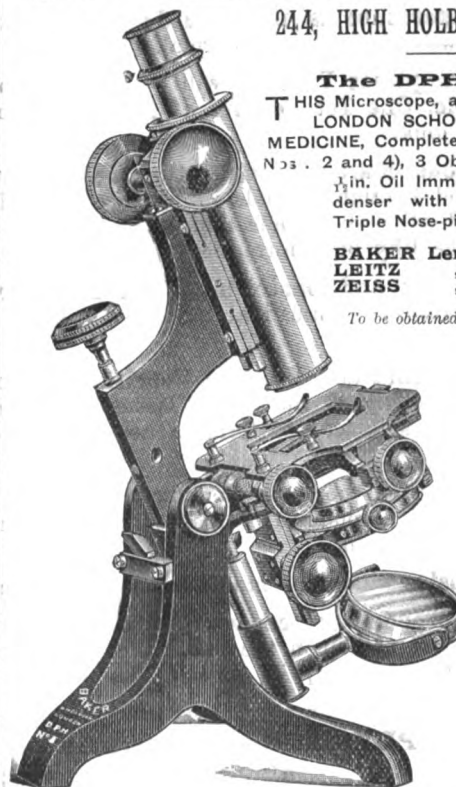
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The Journal of Tropical Medicine.

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In order to meet the constant enquiry for addresses of respectable firms catering for the various require-
ments so difficult to obtain abroad, we give a list of names and addresses which we trust will be found
useful to our numerous correspondents and subscribers.

Original Communications.

CHAPPA.

By EDWARD H. READ, M.R.C.S., L.R.C.P.
Lagos.

THE disease called chappa by the Popo people, in the western district of the colony of Lagos, seems to me to be a specific ailment, and one which I have not seen described in any of the text-books.

I have had six patients, two male and four female, during the last two and a half years I have been in charge of the district.

Signs and Symptoms.—The patients all give the same history. The disease commences with severe pains in the limbs, muscles and joints. After a few months the pain decreases and some joints begin to swell and convey the sense of fluctuation. About the same time nodules develop in different parts of the body. These nodules are in the subcutaneous tissue, and are about the size of a pigeon's egg. After a time, without the formation of an abscess, the skin over the nodule ulcerates and exposes a circular or oval ulcer with a fatty looking base. The nodules may be single, but are more often multiple, and may be so close together that when ulceration ensues the ulcers coalesce forming a serpiginous ulcer. Sometimes the nodules are absorbed without proceeding to ulceration. The ulcers are very chronic and last for years, sometimes healing in one place and gradually extending in another. The joints I have seen most affected are the knee, elbow and wrist. The sense of fluctuation was so marked in one case that I opened the joint, but no fluid exuded, a fatty looking material protruding through the incision. The disease after a time attacks the bones, and the joints may become totally disorganised.

Treatment.—I have tried various kinds of treatment with doubtful success. Iodide of potassium and

perchloride of mercury have been exhibited for months but with very little improvement. A long continued course of arsenic seems to have done good in one case.

The ulcers themselves I have treated by scraping, applying sulphate of copper, pure carbolic acid or iodo. Some of the ulcers have healed well, but the disease has broken out again in other parts of the body.

I should be obliged if any of your readers could give me any information of this disease.

In my opinion it is neither tubercular or syphilitic. There may be some connection between it and rheumatism, which is so common among the natives in this district, the place being very damp and surrounded with swamps.

I have examined the blood of these patients, but with a negative result except in one case in whom I found the malignant malarial parasite. Up to the present I have not had the chance of examining a case on the *post-mortem* table.

I send you a photograph of four patients, which I am sorry to say is not very clear. I also append the history of each case, beginning on the left.

(1) Wuru, Hausa, aged 35, male. Five years ago he had acute rheumatic-like pains in all his limbs which lasted for some months. The right wrist then began to swell, and a small lump formed over the back of the forearm. After a time the skin gave way and a circular ulcer formed. During the next few months other lumps were formed in the forearm and back of the hand; these in turn became ulcers.

I saw him for the first time in May, 1899. He had then been ill for over two years, and the whole of the right forearm was a mass of ulceration which had a fatty looking base. I gave him liq. arsenicalis m^v . three times a day, cleaned the ulcers with carbolic acid, and applied boric ointment. He gradually improved, and now there are only one or two small ulcers left near the elbow.

(2) Phebe, Popo, aged 50, female. Three years ago she suffered from acute rheumatic-like pains for some

months. The left knee then began to swell; after a time the skin on the outer side of the patella burst, but no fluid exuded; a small ulcer formed which gradually healed, leaving the cicatrix which is seen in the photograph. About the same time nodules formed over the inner end of the left clavicle. These ulcerated and extended to the bone.

I saw her first six months ago, when she came to me because her left elbow was swollen. I examined it carefully, and was so positive that I detected fluid that I opened the joint, but to my surprise no fluid came out and the incision was filled with a fatty looking material. I gave her iodide of potassium and arsenic, but after a few weeks small nodules were formed just below the elbow; these soon became small ulcers with the same peculiar fatty looking base. These I scraped, but they have not healed well. About a week ago the left knee became painful and again began to swell. To the touch it feels as if it were full of fluid. This I am painting with iodine. There are also marks of old scars over the two shoulder blades and the skin is adherent to the bone.

(3) Afosewe, Popo, aged 40, female. About eight or nine months ago she had severe rheumatic-like pains, and five months ago nodules formed over the right elbow and left abdomen. She came to me three weeks ago, and there were nine small ulcers around the right elbow joint, which is considerably enlarged. The left side of the abdomen is a mass of ulceration. They are all superficial and are improving under treatment.

(4) Sosi, Popo, aged 45, female. Some years ago she suffered from severe pains in the joints and limbs. After some time nodules were formed in different parts of the body, notably the scalp. One over the frontal bone proceeded to ulceration, which extended down to the bone. This healed after many months, but the external plate has exfoliated and the skin is tightly adherent to the bone over the whole surface. I saw her first eight months ago, when she had ulcers on the right arm and left shoulder. I gave her iodide of potassium and perchloride of mercury and scraped the ulcers. The ulcers have nearly all healed, but two months ago she developed a nodule in the scalp which has since become absorbed. About the same time three nodules were formed in the left axilla, one of which became absorbed but the other two proceeded to ulceration. These have gradually healed, but at present she has five nodules in the scalp which are very painful, and are situated over the two parietal and occipital bones. They are not shown in the photograph.

Of the other two cases, one a male Popo, aged 45, gives the same history of the disease, commencing with severe pains. His left knee then began to swell, and the joint has become completely disorganised and has a flail-like movement.

The other, a female Popo aged 50, has a mass of ulcers over the right elbow, which is enlarged, and the bone of the arm is broken about two inches above the elbow joint. She informed me that it was not broken by violence but as a result of the disease.

On mentioning the disease to Sir William Macgregor, M.D., K.C.M.G., he told me he had seen one or two cases in Fiji, which gave the same history of

starting with rheumatic-like pains, and that the joints afterwards became swollen, but contained no fluid. He had never seen the disease attack the bones. Perhaps he had seen the disease in an earlier stage. None of my patients came to me until ulceration had well advanced.

British Medical Association.

A DISCUSSION ON MALARIA AND ITS PREVENTION.

I.—NOTES ON ANTIMALARIAL MEASURES NOW BEING TAKEN IN LAGOS.

By HIS EXCELLENCY SIR WILLIAM MACGREGOR,
K.C.M.G., M.D., Governor of Lagos.

THESE few field notes to be read at a discussion on Malaria have been written on the suggestion of Major Ronald Ross. The writer of them is deeply sensible of the honour conferred on him by being asked to prepare them—a request which has very willingly been complied with.

The general outline of the natural history of the malarial parasites is here accepted as sufficiently established for practical purposes by the unique and glorious labours of Major Ross. In these notes, therefore, only the practical aspects of the question are touched upon.

It may at once be premised that to no other country of the same size is the subject of malaria of greater importance than it is to Lagos. Its economic and industrial future very largely depends on whether malaria can be successfully combated or not. Lagos has been a malaria centre that has earned a very unenviable reputation. It is very favourably situated for commerce; geographically it is the natural port of outlet of the great interior province of Northern Nigeria. It seems clear enough that practically only two things are wanting to make Lagos a great and prosperous commercial town, by far the greatest in West Africa. These two things are the extension of the Lagos Railway to Northern Nigeria, and the control of malarial fever. The two undertakings are in practice closely connected together, and perhaps malaria is not the less important of the two. Both are practicable, but malaria is the more urgent, and therefore should be dealt with first. Malaria can also be coped with on a greater or lesser scale in proportion to the means available from time to time. Some of the steps now being taken in Lagos to combat malaria will be mentioned herein, more particularly from the point of view of the administrator.

It may be admitted at once that at Lagos, as probably everywhere else, the academic rules of procedure cannot in any one direction be carried out with scientific minuteness and detail. The measures adopted must be such as can be accomplished by the men and money at disposal; and as these co-efficients will very likely not be on the same scale in any two British colonies, the attack on malaria will doubtless be planned out differently according to local circumstances. Were there ample funds at disposal the

measures now taken in Lagos would be different from what they actually are at the present time.

It has been felt to be an important preliminary necessity that every effort should be made to acquaint with the general principles of the present malarial doctrine, not only the Europeans resident in this country, but also the natives of every degree of civilisation. For this purpose the reports of Professor Koch on his Eastern expedition, in which he demonstrates so effectively the specific action of quinine on malaria, have been translated and published in suitable pamphlet form, and have been widely distributed. The same course has been adopted with regard to Professor Celli's very convincing report on the use of mosquito netting on the Italian railways. Extracts have similarly been published and distributed from the reports of English expeditions and from other similar English works, including a paper on health, read by Dr. Strachan, Chief Medical Officer of Lagos, at Liverpool. A short course of popular lectures on malaria and dysentery has been delivered in Lagos by Dr. Best. These lectures, in which the use of technical terms and phraseology has been carefully avoided, have created a much larger amount of interest, and been far better attended, than one could have dared to hope for. It is contemplated that teachers in public schools, who have diligently attended Dr. Best's course, should impart to their scholars the rudiments of the malarial doctrine in a health class, which will be examined by an inspector in much the same way as any other school class, and will count equally with reading and writing for the distribution of the school grant. The Chief Medical Officer is now preparing a general course of lectures on sanitary subjects; and it is intended that these shall be repeated at different places, in the native language, by one or more of the medical officers that are natives of the country. It is certain that by these means, and by an intelligent appreciation of the vast importance of the subject to this country, a degree of interest in the question has been created in the public mind here that one could not have expected. It is very important that people should at the outset generally understand and believe the theory of malaria. Belief has become more general than one could have foreseen. It is gradually becoming understood.

In active operations the greatest attention is being given (1) to the prevention of malaria by the administration of quinine; and (2) to the use of gauze netting; while (3) at the same time the mosquito is attacked in his breeding ground.

The Administration of Quinine.

It appears highly probable that at least as much can be done here by the use of quinine as a preventive as by the employment of mosquito netting.

The greater number of Government officers take quinine regularly; but, of course, so long as taking quinine is not compulsory there will always be a residuum of men that, either because they cannot tolerate quinine, or for some other reason, will not use it as a preventive of fever. There are some half-a-dozen such in this service. This remedy is as much required for native as European officers. In 1900, 79 cases of fever in European officers, of an average

duration of 4.5 days, were treated by the medical officers, as against 149 cases of an average duration of 3.4 days among native officers. From January 1st to May 23rd the figures have been 15 European cases of an average duration of 7.5 days, against 47 native cases averaging 3.38 days. This gives a total of 94 European cases and 196 native cases.

Recently no fresh case had occurred in Lagos for nearly a month. Then one case presented itself, and that one case occurred as opportunely for the malaria doctrine as if it had been made to order, for it was in the person of an officer on whom quinine produced its evil effects in an aggravated form, so that he could not take it as a preventive. As a symmetrical demonstration of the theory a second officer that shared the same quarters should have contracted the contagion from the first one, for the quarters were full of mosquitoes. But he took much quinine and escaped, thereby illustrating the already proved value of quinine as a preventive.

In all probability the day will come before long when newly-appointed officers for places like Lagos will have to undergo a test as to whether they can tolerate quinine or not. A man that cannot, or a man that will not, take quinine, should not be sent or remain in a malarial country, as he will be doing so at the risk of his own life and to the danger of others.

The more common method here is to take daily doses of from $2\frac{1}{2}$ to 5 grs., but several take a large dose weekly, and others irregularly. Each Government officer has been directed to obtain from the chief medical officer the quinine he requires for his tour of service. It is not improbable that it may eventually become a rule of the service that when an officer that has not been taking his quinine regularly gets fever, he will lose salary for the time he is laid up with it, unless he can show that he cannot tolerate quinine. So far as officers of the Government are concerned, it seems to be already tolerably certain that by the use of quinine, regularly taken as a prophylactic, they can be kept practically almost free of fever. We have had no serious case this year.

The great difficulty is how to extend this preventive treatment beyond the service, more particularly to the uneducated masses of the natives. It is simply impossible to protect the whole population by quinine administered as a prophylactic. In the first place, the great mass of natives would not take the medicine; and in the second place, the Government could not afford to pay for the seventy tons of quinine a year that would be required to give even a daily grain dose to each of 3,000,000 of people. Quinine as a preventive will not at present be given to natives outside of the town of Lagos. A special vote of £500 has been made for the purchase of this medicine for this particular purpose. A public dispensary already exists in the town, at some distance from the general hospital. At this dispensary between 2,000 and 3,000 patients are treated annually. A second dispensary is being constructed in Lagos, and a third one at the suburb of Ebute Metta. It was felt that this, and the appointment of a special medical officer to attend the poorer natives, would still fail to reach a large number of the indigent and more ignorant. To take up this

work a large number of the educated ladies of Lagos have formed themselves into a league, chiefly for the purpose of administering quinine to native children and others suffering from or specially exposed to fever. These ladies are natives of West Africa, but many of them have been well educated in England. It is hoped that they may be able to induce many natives to take quinine that otherwise would simply refuse it. The league is at least an important educational institution.

Mosquito Netting.

It is not likely that in a place like Lagos as good results can be obtained from the use of mosquito-proof netting as in Italy. One great objection to it here is the serious and highly disagreeable way it checks ventilation. This is a difficulty that cannot be fully brought home to one in a cold climate. But in a low-lying hot, and moist locality like Lagos, it comes to be a choice of evils to sit inside the netting stewed and suffocated, or to be worried and poisoned by mosquitoes outside. The netting is hardly a feasible remedy as regards native houses. It is not possible to protect even European quarters completely by it. Few officers or others are so occupied that they could spend the day in a mosquito-proof room. Certain it is that any man that suffers from the singular delusion that mosquitoes bite only during the night would have a speedy cure by spending a few days, or even a few hours, in Lagos. Operations here are being limited to supplying one mosquito-proof room to the quarters of each officer. In this he will be able to spend the evening free from mosquitoes if he chooses to do so. The European wards of the hospital are similarly protected. Hitherto we have used only muslin, as the wire netting ordered in England last November has only just now reached us. Much importance seems to be attached to the question of the material to be used in making the metallic netting, which alone can last in this climate. Muslin becomes full of mildew and rots in a few weeks when exposed.

We have had here a very useful experience as to the materials required for the metallic gauze. In May, 1894, some 250 yards of galvanised wire netting was obtained from England and was used in building rose houses at Government House in August of the same year. Those houses have been examined by the Assistant Director of Public Works, who says they will be good for four years more. This shows a vitality in this climate of some half score years for the galvanised wire netting. The experiment seems conclusive for Lagos, and in future this kind of gauze will be used instead of the expensive article made of compounds of copper.

The Attack on Mosquitoes.

The measures taken for diminishing the number of mosquitoes are various. The most expensive is the slow, laborious, and costly one of filling in the swamps of Lagos. That is being done chiefly by convict labour, but will be much expedited soon by steam power. Meanwhile kerosene is being used on some of the swamp pools most favoured by the *Anopheles*. It is an unfortunate fact that the *Anopheles* is, at least in certain parts of Lagos, the most common mosquito.

About 70 per cent. of the many that haunt Government House are *Anopheles*, and unhappily they puncture one all day long.

Many of the water tanks about European quarters are found to contain large numbers of mosquito larvæ. A tinsmith has recently been engaged from England whose first duty it will be to make all water tanks mosquito-proof. It appears from many observations that mosquitoes do not breed in the Lagos wells, though they are seldom over twenty feet deep, while many are considerably shallower. Fortunately for Lagos the town is built on sand, through which rain pools soon disappear by filtration. But for that accident the place would be simply uninhabitable.

It is strongly recommended in certain competent quarters that to get away from infected mosquitoes Europeans should live at places apart from natives. This may be called the academic view. From the administrative point of view it is an unacceptable doctrine. The academic view is ungenerous, and would afford no radical remedy were it practicable, which it is not. The policy followed in Lagos in this as in other matters, is to take the native along with the European on the way leading to improvement. Here they cannot live apart nor work apart, and they should not try to do so. Separation would mean that little, or at least less, would be done for the native, and the admitted source of infection would remain perennial. To simply protect the European from fever here would never make Lagos the great commercial port that it should become. What we can do in this matter for the uneducated part of the Lagos population will be effected chiefly by reclaiming swamps and administering quinine.

It is a fact that has been impressed on myself in a marked manner during the last few weeks that mosquitoes are much more numerous about European quarters than about native dwellings. Up country there are not a few mosquitoes at every European quarter we put up, while at many native camps there were none. The reason of the difference seems to consist in the tanks and other receptacles for water, and in the greater frequency of pools about the quarters of Europeans, one of the results of greater cleanliness. In the interior, speaking generally, the two places at which mosquitoes most abound are European quarters and the tops of the hills, the two localities at which one would reasonably expect them to be least numerous. The explanation with regard to the residences of Europeans has been given. In the granitic or gneissic hills there are numerous natural fissures, sometimes large numbers of artificial excavations that have served as mortars for grinding corn. In these fissures and excavations mosquitoes breed in large numbers. On the other hand, the low-lying country almost always consists of porous sandy soil through which rain is filtered into a subsoil of gravelly formation. A clay surface along which rain water runs is exceptional. The final result is that for six months in the year the propagation of mosquitoes is practically at a complete standstill in the interior. The soil becomes extremely dry, and remains in that condition for several months. One hardly ever sees a pool anywhere save in the beds of rivers and creeks of a considerable size. As these

latter are full of small fish the mosquito larvæ bred there have extremely little chance of survival. During the dry season there was not a mosquito to be seen at Oloke-Meji, on the Ogun River, a place that one would have expected to have been infested with them. It is the sandy porous soil of this country and its long-continued dry season that reduces the number of mosquitoes here to a very small fraction of those met with in a place like British New Guinea, for example. It would perhaps be possible to exterminate the mosquito altogether in the Lagos hinterland, if it were practicable to prevent their production near the coast, and their arrival from elsewhere. It is quite clear that the dry season here is a mighty factor against the mosquito and a most encouraging ally of his enemies. It was very noticeable at Lagos this year how the first shower of rain that fell brought at once on the scene a considerable number of mosquitoes where none were present before, just as if they had been unable to go abroad without something to revive them.

Doubtless it is in a great measure due to the long-continued absence of rain and to the nature of the soil that there is so little fever in many inland towns. The chiefs of some of them wish to make out that they have no fever at all. Others admit that they lose children by it. It is intended that the medical department should make a sufficient number of observations on children at those places to determine how far they are free from, or suffer from, fever. A European town would probably have much more on the sites of these native settlements on account of the freer use of water. The chiefs of these inland towns unanimously state that they have no "blackwater fever" there.

With the sanction of the Secretary of State the measures being taken to improve the sanitary condition of the town are being applied as far as practicable to the railway. "Borrow pits" near all stations are being filled up, or kerosene is used on them. The mosquito netting is to be employed there as in other quarters. Certain buildings have to be shifted. But there is nothing peculiar in this. In the dry season mosquitoes will all but disappear on the railway with reasonable attention to drainage.

In the matter of large trees, of which there are not a few in Lagos, a compromise has been adopted. It did not appear desirable to deprive the Lagos subsoil, which is made up of sand and mud, of the great pumping power that must be exercised by the many large-crowned trees now growing here. On the other hand, these trees did afford shelter to many mosquitoes. They have been thinned out, all undergrowth has been cut away, and all the lower branches that could be lopped off without disfiguring the tree have been removed to allow free passage to the sea breeze which generally blows at Lagos.

It is painfully apparent that what is being done at Lagos against malaria is far short of what is required, but it is a beginning, and if these measures are continued for even two or three years the effect will begin to be felt to such an extent as to encourage their continuance, let it be hoped, on a greater scale.

Malarial fever is not the only disease that creates a great mortality here. Large expenditure has to be

incurred with special reference to dysentery for instance. The total sum set apart for sanitary and health purposes in this colony during the current year is not under £34,500, or about one-seventh part of the whole revenue. More cannot be done without deranging other parts of the administrative machinery, which in turn would stop sanitation.

[After Sir William MacGregor's paper was read copies of lectures which had been delivered to the general public in Lagos were passed round. Two of these we have already published in the JOURNAL.—ED.]

II.—NOTE ON THE HABITS OF EUROPEANS IN INDIA AND AFRICA IN RELATION TO MALARIA.

By Major RONALD ROSS, F.R.C.S., F.R.S.¹

It can scarcely be disputed that the health of Europeans on the West Coast of Africa is in general much worse than in India. We can, however, suggest two explanations of the fact. Either the disease potential of West Africa is greater than the disease potential of India, or the mode of life of Europeans exposes them to infection more in the one country than in the other.

The first of these explanations—that Africa is actually more unhealthy than India—is the one which is generally accepted, but before admitting it we should inquire whether the excess of sickness in Africa may not possibly be largely due to the neglect of certain precautions which are more generally taken in India. In my experience the habits of Europeans are very different in the two countries. How far does this difference influence the sick list, especially from malaria?

There is probably only one really accurate method by which we can determine the degree of malaria in a given locality, and that is by ascertaining the average time in which a newcomer becomes infected. The shorter this period the greater, evidently, the malaria potential of the locality. Native children constitute the class of newcomers most accessible for making the estimate, and in order to compare the malaria potentials of Africa and India it would be necessary to carry out extensive blood examinations of the native children in both countries. Such examinations have been frequently made in Africa, but not, so far as I remember, in India. Hence, it seems to me we have no strict reasons at present for declaring that Africa is actually more malarious than India. It may prove to be the case that as many children are infected in India as in Africa; and certainly several informal observations of my own in various parts of India suggested that a large percentage of native children were infected in those parts (Secunderabad, Darjeeling, Terai, Nowgong District). If this surmise prove correct, we shall probably be compelled to attribute much of the malaria-rate among Europeans in Africa to other causes than to a greater malarial potential. What these other causes may be I shall now endeavour to indicate.

I would first draw attention to the following remarkable facts about Indian malaria. In Calcutta autoc-

¹ Taken as read in the unavoidable absence of the President.

thousanous malarial infection is scarcely known to occur (it is, at least, far from common) among the thousands of European citizens, who would indeed be very surprised to learn that Calcutta is a malarious city. But as a matter of fact malaria does exist, and to a very considerable degree, among the native population. The same thing occurs, according to my experience, in Madras, Bangalore, Bombay, and probably in many other stations. In Madras, Maitland has noted an analogous fact—that while filariasis is very common among natives, it is very rare among Europeans.

On the other hand, as soon as we leave the large Indian stations, and travel into the districts, we find malaria to be much more rife among Europeans. Officials on district work, sportsmen, and troops on service frequently become infected. In certain large areas occupied by planters, such as the Nilgiri, Assamese, and Terai plantations, malaria is just as common, or even more common, among Europeans than among natives. In fact, to judge from my own observations, the conditions as regards malaria of the Europeans in these Indian plantations approximates closely to the West African conditions.

To what cause are we to attribute the comparative indemnity of Europeans in the larger Indian stations? It can scarcely be due to a smaller malaria potential, because the natives in these stations often suffer with great severity.

In considering this question I have been much struck of late by the fact that, as already mentioned, the habits of Europeans in the Indian stations differ in several important particulars from their habits in Indian plantations and in Africa. I refer especially to the habitual use of punkahs, mosquito nets, well-built houses, and comparatively good food in the Indian stations. On the other hand, these comforts are often or generally wanting in the Indian plantations and the African coast towns; and it is just where they are wanting that the Europeans suffer most sickness.

Let us compare, for example, the habits of a European in a business house in Calcutta with the habits of a European in West Africa. In Calcutta he sleeps under a punkah or mosquito-net, or both; he dresses and breakfasts under a punkah; he works all day at his office under a punkah; in the evening he takes vigorous exercise, and he dines under a punkah. He wears the lightest possible clothing; he lives in a solid, cool, airy house, and he obtains very good food. Once in five or six years he returns to Europe for leave. The result is that he leads a comparatively healthy, vigorous, and comfortable existence. Many men in Calcutta have informed me that they seldom feel unduly warm, and the constant use of the punkah certainly has the effect of cooling the skin and keeping off mosquitoes and other obnoxious flies. The houses, being built in the European quarter and surrounded by a considerable "compound," are usually well segregated from the native neighbourhood, and the good food and exercise preserve the general health of the majority of European settlers.

In Africa the houses are frequently very bad. In Freetown, for instance, they are the same as the houses of natives, and are mingled with these, being often nothing but a kind of wooden shanty, without

sufficient verandahs and gardens, and frequently built over native shops in a manner which fills a European coming from India with astonishment. The Anglo-African seems to imagine that he can live in the tropics in the same manner as he lives in England. He seldom uses a punkah, except, perhaps, for an hour at dinner time, and not seldom he neglects even the mosquito net. The food is often or generally execrable—fresh milk, butter, and vegetables not being procurable. Tea can seldom be obtained, and aerated waters cost sixpence a bottle. Owing to the frequent absence of gymkhanas and clubs, the exile obtains little suitable exercise: and the country being too "unhealthy" for ladies, sociable recreations are few. A similar state of things often prevails in the planting districts in India.

The result is that the European often leads in these countries a most doleful existence. Bathed day and night in perspiration, constantly bitten by mosquitoes, without healthful exercise, cheerful society, good food, or even such comforts as ice, he is not only always open to malarial infection, but soon undergoes a marked general deterioration of his body due to the incessant heat and discomforts in which he lives. His one desire becomes, not to render his present life more agreeable, but to escape from it on leave to England as soon as possible—a state of things which does more than anything else to ruin the business and progress of the country.

I cannot record too strongly my own conviction, based upon experiences formed both in India and Africa, that the "unhealthiness" of the latter country is really chiefly due to the causes I have just referred to. Most especially I think it is due to the neglect of the punkah, even more, perhaps, than to the neglect of the mosquito net. It becomes more and more evident to me that the use of the punkah, or at least the electric fan, is indispensable to Europeans in the tropics, not only for keeping off mosquitoes, but for preserving the general vigour of the body.

Scarcely less important are the dairy, the vegetable farm, the ice machine, and the soda-water machine. All these comforts, foolishly called luxuries, are in reality absolute necessities for healthy life in the tropics. The European quarter, the well-constructed house, and the large open "compound," are no less important. The slow progress of the African colonies is chiefly due to the stupid indifference to these details; while the great fabric of our Indian Empire is really based upon the wise habits of life which render existence tolerable for the men who have constructed it.

III.—THE PREVENTION OF MALARIA IN HONG KONG.

By J. M. Young, M.B., F.R.C.S.Ed.

THE prevalence of malaria in the island of Hong Kong has not only been demonstrated by finding the various types (both benign and malignant) of the malarial parasite in the blood of patients, but also by whole districts mapped out as notoriously unhealthy, houses after being built standing uninhabited, whole terraces unlettable, and having to be pulled down, because of the amount of fever from which the

inhabitants suffered. For six months under the military and civil authorities I made extensive experiments over considerable areas, with the object of finding out the cause and making suggestions as to the prevention of malaria.

Alike from adult mosquitoes secured and examined, and from larvæ collected from various breeding pools and developed in captivity two distinct varieties of *Anopheles* are abundant—*Anopheles costalis* and *Anopheles sinensis*, and nearly a dozen distinct species of *Culex*, the proportion of *Anopheles* varying in different localities as shown in the following table made out by Mr. J. C. Thomson, M.D., M.A., taken from the Governor's Gazette, January 11th, 1901:—

	Mosquitoes examined	ANOPHELES		CULEX	
		Number	Per cent.	Number	Per cent.
No. 1 Station ..	260	6	2.3	254	97.7
Pokfulam ..	39	13	33.3	26	66.7
Aberdeen ..	101	1	1.0	100	99.0
Stanley ..	147	3	2.0	144	98.0
Shek O ..	125	70	56.0	55	44.0
Tai-po ..	216	111	51.4	105	48.6
Sha Teu Kok ..	141	54	28.3	87	61.7
Sheung Shui ..	76	1	1.3	75	98.7
San Tin ..	8	1	12.5	7	87.5
Tai O ..	68	20	29.4	48	70.6
Tung Chung ..	55	11	20.0	44	80.0
Choung Chau ..	575	1	0.2	574	99.8
Lamma ..	32	2	6.2	30	93.8

The localisation of the various *Anopheles*' breeding pools around twenty selected districts where malaria had distinctly and repeatedly manifested itself, gives some important information as to the range of an infected area from a given nidus. From these I have chosen six, of which I give full details and measured distances, with rough sketch maps.

(1) The Military Sanatorium.

An isolated building, with accommodation for two companies and officers' quarters, situated on the hillside above Hong Kong City. The history of this building is most instructive. Three years ago, owing to the prevalence of malarial fever of a most malignant type (80 per cent. of the last company sent there being down with malaria) the building had to be closed. This valuable property had assumed a most deserted appearance, the trees, shrubs, and grass having grown up all over the hillside.

After carefully examining the various streams around, the haunts and breeding places of *Anopheles* were very distinctly localised; many adult *Anopheles* were captured, and the discovery of dozens of their breeding pools within a few hundred yards of the sanatorium made me safe in pointing out the cause of the notorious name which this building had acquired, and in suggesting the remedy, by destroying them in the bush and preventing others from breeding in the pools and bogs around. In the immediate vicinity of this building numerous bogs of mud and rank grass, with an aggregate area of not less than half an acre, exist; these bogs lie hidden in the hollows of the hills, and nothing could be more like African fever swamp. These forming with the luxuriant vegetation

around the best nidus for the development and subsequent life-history of mosquitoes. (Within eighty yards of the main building with an ordinary teaspoon I scooped up four *Anopheles* larvæ at one time.)

The officer commanding (General Gascoigne) having given me full liberty and granted 150 Indian troops of the Hyderabad contingent, we began by clearing the hillside, working out from the main building, cutting and burning absolutely the undergrowth and tangled creepers—this for a distance of 300 yards occupied the men for a period of two months. The bogs and pools were then drained by ordinary surface draining, and for a period of at least two years this area is to be kept rigorously free from the dense impenetrable undergrowth. The health of the troops has remained good during the whole time, and the building is now inhabited by white soldiers.

(2) Lyemooon Barracks.

A modern building situated 200 feet above the sea, on the hill commanding the Northern Pass to Hong Kong Harbour. The persistent outbreaks of fever and the almost continuous stream of patients sent to hospital from this building rendered the question an extremely important one to the military authorities.

On the north side, nestling in the hollow of the hills, I found numerous pools and small bogs in which were hundreds of larvæ of *Anopheles*, especially in and around the rice fields cultivated by the Chinese, in one case within eighty yards of the barracks.

On the west side, 180 yards from this building, is the police station and Chinese village of Sakiwan, which have been free from malaria. Mosquitoes have been regularly collected by the police, no *Anopheles* have been caught, and no "fevers" are reported among the native police or in the village of 1,500 population. Thus the distribution of *Anopheles* conforms accurately to the history of the outbreak of malaria, as, after exhaustive search, I was unable to find one breeding pool with *Anopheles* larvæ round Sakiwan.

(3) Men's Married Quarters, Kennedy Road.

A magnificent new building, only opened a year ago in July. The rooms airy and all modern conveniences, little or no malaria in the district. Unfortunately the builders left rubbish and pools lying around the house. In one of these artificial ponds were hundreds of larvæ of *Anopheles* within fifty yards of this building. There were no *Anopheles* in the surrounding streams when I examined them in August. After a time these pools were filled up and drained, but before that hundreds of adult *Anopheles* must have developed and were then living in the bush; they were secured in and around the building. Note what occurred. When the *Anopheles* were driven from their breeding pools they took the next best pools, and I found them in December in the streams around, in pools which I had examined three months before with a negative result. Then gradually the children began to have feverish attacks, and the inhabitants of the houses around complained, the Military Women's Hospital became crowded with patients, until within six months of the opening of this building out of 73 women and children 33 per cent. had fever, of the

children under 10 years 50 per cent., and unfortunately there were three deaths to record; and in a few selected cases among the children the blood under microscopic examination contained parasites.

(4) Pokfulam.

The French Fathers sixteen years ago bought property for schools and training colleges, which four years later, owing to almost continuous attacks of fever and the sad loss of life therefrom, they had to relinquish at considerable loss and remove to another site about a half a mile from the old place; again, in another building occupied by Madame Musso, 300 yards further west, fever has been common. In the present building occupied by the Fathers and 150 children they have had little or no malaria; and on the most careful examination I was unable to discover one larva of *Anopheles*, while in and around the old site and around the house occupied by Madame Musso, I found them breeding in hundreds. As this is the history extending over years, and as the facts conform accurately to the prevalence of *Anopheles* and malaria, it would afford strong presumptive evidence of the distance travelled by mosquitoes over an infected area.

(5) Mount Richmond.

One of the finest private residences in the Colony, originally costing 130,000 dols., was sold for something like 25,000 dols. At the request of the owner I examined this district, and from the report sent to him I read the following:—

"The history you gave me of the various buildings and the prevalence of malaria was most instructive, and from it alone I felt sure that there must be some breeding pools in the immediate vicinity, but I hardly expected to find them so close to the building and so localised. I have to-day taken nearly a hundred larvæ of *Anopheles* from a single pool within eighty yards of your house. I have no hesitation in saying that you could not be without fever, and that this fully explains why for years the district has had a fever-stricken name."

Why is it that within fifty yards of this property, separated by a road and a clear space, other houses were free from malaria, and the inhabitants lived for years in comparative immunity? The cause and effect are so distinctly marked out that I was fully justified in promising the owner a permanent and effective cure which would greatly enhance the value of his property at a comparatively small cost.

(6) Tai-po Police Station.

The following extracts from a report, dated Hong Kong, November 17th, 1900, by Drs. J. M. Young and John C. Thomson, gives the results of an inquiry into the causation of the prevalence of malarial fever at Tai-po:—

We have the honour to report, for the information of His Excellency the Governor, that in accordance with His Excellency's instructions we proceed to Tai-po for the purpose of inquiring into the causation of the marked prevalence of malarial fever there recently.

We already had before us the following statistics as to the prevalence of mosquitoes at Tai-po during the preceding months:—

Date.	Mosquitoes Caught.	Anopheles.	Culex.
September 4th	50	1	49
" 19th	11	4	7
" 24th	62	23	39
October 4th	50	5	45
" 17th	37	33	4
" 21st	44	27	17
November 12th	55	33	22
Total	309	126	183
That is, <i>Anopheles</i>		40 per cent.	
" <i>Culex</i>		60 per cent.	

So that during the period between September 4th and the date of our visit, 40 per cent. may be taken as the actual average prevalence of the *Anopheles sinensis* among all mosquitoes found.

From police records placed at our disposal, we ascertained that the cases of fever among the police during the last twelve months have been as follows:—

	Number of Cases.	Average Police Strength.
Half November, 1899	5	2 Europeans, 7 Indians.
December	2	" "
January, 1900	1	" "
February,	2	" "
March	2	" "
April	0	" "
May	2	" "
June	5	" "
July	13	3 Europeans, 22 Indians.
August	27	" "
September	28	" "
October	17	" "
Half November	1	" 14 "

We made careful search in all directions around the Government buildings and matsheds for breeding places of *Anopheles*. From the results of our search, we direct attention to two important points: (1) that the breeding pools that proved most important, and which even at this late date in the year contain abundant larvæ, are within 80 yards of the police station, and 40 yards from the matshed occupied by the civil staff; and (2) that the marshy stream above referred to is a permanent and prolific breeding ground.

We examined under the microscope the blood of ten children from the village nearest to the police station.

Sex.	Age.	Type of Parasite Found.
M. ..	3	Benign tertian gamete.
F. ..	8	" " rosette.
M. ..	14	Nil.
M. ..	9	Nil.
M. ..	3	Æstivo-autumnal gamete.
M. ..	15	Nil.
F. ..	5	Young æstivo-autumnal.
M. ..	14	" " "
M. ..	9	Nil.
M. ..	8	Nil.

Thus in 50 per cent. of the cases examined we found the parasites of malaria; 2 cases were of benign type and 3 malignant, and while all five children were infective to the mosquito, rendering any *Anopheles*

feeding upon them capable of a few days later transmitting the disease to other persons, in 2 cases the form of the parasite that actually came under our observation was the gamete, namely, the form which when ingested by the mosquito is capable of undergoing metamorphosis in the body of that insect.

In the abundance of mosquitoes of the *Anopheles* genus above described, with their breeding-grounds almost close up to the Government buildings, and in the near proximity of an extensively-infected native population, by which many of these mosquitoes are being continuously rendered infective to healthy persons who may be bitten by them, we have the factors that account sufficiently and conclusively for the fevers that have prevailed among the Government officers at Tai-po.

We are of opinion that the seasonal increase of fever cases that has been observed at the time of ploughing, and at the period of harvesting the two rice crops, is due to the disturbance at these times of mosquitoes usually resting among the grass or growing paddy, and feeding on Chinese coming within their reach, such disturbance resulting in their flying further afield and finding their way in larger numbers to the houses on the hills.

I would emphasise the practical impossibility of dealing with the larvæ of mosquitoes by any germicide on account of the hidden nature of many of their breeding places, which were only found after the undergrowth was removed; and on account of the luxurious vegetation in which the adult mosquitoes live. Culecides, petroleum gas, lime, gallol, &c., are only subsidiary measures, although undoubtedly useful.

The only permanent and effectual method seems to be that adopted in Hong Kong: (1) Clearing all long grass and undergrowth, and then (2) destroying all breeding places by draining, &c. Alike from observation and experiment, I would place a cleared area as of immense importance; no mosquitoes will fly far without vegetation, and old residents in West Africa have by experience found this out, and regularly burn the bush, and this is over and over again emphasised in various localities in Hong Kong; even a road intervening made all the difference to the health of a community.

Extensive experiments have been made as to the destruction of mosquitoes and their larvæ by the "natural enemies of mosquitoes," dragon flies, tadpoles, small fish; the whole subject seems to me of little practical importance. I have repeatedly put 20 *Culex* larvæ and 20 *Anopheles*, collected from different pools, together. The effect was astonishing. Within twenty-four hours there was no trace of the *Anopheles* larvæ, and like Pharaoh's lean kine the *Culex* did not seem any the fatter for having absorbed them; indeed, no one can realise the intensity of the struggle for existence which goes on in a stagnant pool until he forces himself with a large hand lens to watch the various forms of life with which the water is swarming. *Culex* larvæ, then, are an important factor explaining why in many places where mosquitoes are more numerous there is no malaria, the weaker *Anopheles* being overcome in the struggle for existence.

Conclusions.

These results, and the details of other places, led me to the following conclusions:—

(1) That malaria, in every place examined, was invariably associated with *Anopheles*' breeding pools in the immediate vicinity.

(2) That in no case were *Anopheles* found in the neighbourhood of houses without malarial fever manifesting itself repeatedly, that is, where *Anopheles* are found, there is fever, and in every district where there is marked malaria there, the blood of children examined contained the malarial parasite, living *Anopheles* were caught and their breeding pools localised.

(3) That in no case was there a greater distance from the breeding pools to the houses infected than 150 yards.

(4) That the breeding pools were always localised and comparatively easily treated by surface draining.

(5) That the only practical steps found effectual were by clearing the district of all shrubs, grass, bamboos, &c., to driving the adult female mosquitoes and then draining their breeding pools; this combination is absolutely essential, to treat the pools with any larvicide alone means that they scatter and select other pools to lay their larvæ and breed from.

In conclusion, these results corroborate recent investigation made by others, and I believe if properly carried out, even over a limited area, would free that district from the haunts of *Anopheles*, and consequently the horrors of malarial fever. It is no Utopian idea to think that within a few years an island like Hong Kong or Stretton Island, New York, may be cleared by our breaking the extra-corporeal life circle of the malaria parasite. Within the last year I have visited Sierra Leone and seen Major Ross at work, have seen the experiments at Stretton Island, New York, under Dr. Howard, U.S. Entomologist, and I unhesitatingly state that in none of these places would I be more hopeful of the prevention of malaria than in Hong Kong.

(To be continued.)

QUININE ADMINISTRATION IN INDIA.—The Sanitary Commissioner's report shows that some progress is being made in the N.-W.P. and Oudh towards Professor Koch's ideal, the quinineising of the population. A scheme for the sale of quinine through landlords and their agents was introduced in the districts of the Allahabad, Rohilkhand, Lucknow, and Fyzabad Divisions; but as a beginning was made only in October last, it is too early to predict whether the non-official agency will prove successful. The Government of Madras have recently offered to reduce the price paid for quinine in bulk, and we are told that it will be possible, when the arrangements have been completed, to reduce the sale price of quinine packets by one-third. An increased sale of the drug may then be expected.

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THE Journal of Tropical Medicine

OCTOBER 15, 1901.

PRIVATE PRACTITIONERS IN THE TROPICS AND EDUCATION IN TROPICAL DISEASES.

LATELY it has happened that we have come in contact with a number of young medical men proceeding to the tropics to join medical men in practice there as partners or as assistants. In no case had any of them had an education in tropical diseases, and the invariable answer was "I should like to go to the School of Tropical Medicine but I have no time, I sail in a week or two." It is evidently not the fault of the young men themselves, they are all anxious to know something of the work they are about to take up, but it is the period of their departure that hampers them. This will all no doubt in future be changed, and it ought to be changed now.

It is fair to no one at the present day that a medical man should proceed to the tropics without a knowledge of tropical disease. In the first place it is not fair that he should be placed in charge of persons suffering from diseases, which, in some instances, he may not have even heard the name of. The public have a right to expect that the medical man left in absolute charge of a community shall at least have been properly educated, but instead it often happens that the resident practitioner leaves the new comer in charge within a few days of his arrival, and goes home for a year or so, or at least takes a holiday for a few weeks.

If during his absence critical cases arise, the public are justified in grumbling if they are left in the hands of a young, imperfectly-trained doctor; or if there is a rival practitioner in the place the doctor on holiday will find a sadly diminished practice when he returns. It is therefore bad for the doctor's practice and unjust to the public that any man, now the opportunity is afforded him, should (be allowed to) proceed to a warm climate to take up practice imperfectly trained.

It ought to be a stipulation, in fact it will be the most important condition in the contract of engagements in the future, that any assistant, *locum tenens*, salaried partner, or partner, going out to engage in practice in a warm climate, must be trained and certified in tropical diseases before leaving the British shores. If the doctors do not see the necessity and expediency of this condition their patients soon will, and it is probable that after Sir Francis Lovell's journey the first words that will greet a new-comer will be "Have you been through a course at the London School of Tropical Medicine?" The subject of training in tropical diseases will have been brought keenly home to them by Sir Francis's visit; many will have given money to support the institution, and they may fairly expect in turn that their own medical man should be possessed of the advantages this school affords. For the sake of the public and for the sake of the resident practitioner, it is expedient that the advantages offered by a training in tropical medicine be insisted on before going abroad. In



PHOTOGRAPHS OF PATIENTS SUFFERING FROM

CHAPPA.

A Disease met with in Lagos, and described in this issue of the Journal by EDWARD H. READ, M.R.C.S., L.R.C.P.

Hale and Davidsson, Ltd., London.

time, in no long time we believe, medical men taking berths as doctors on board ships sailing to warm climates, will be required to show a certificate of education in tropical ailments; and we would urge the shipping companies, in the interests of their passengers and in the interests of their crews, to *at least give preference* to men trained in tropical diseases, when selecting candidates as medical officers for their ships. In a few years it will not be a question of option or of preference but one of law that the medical officer, to any ship bound for tropical seas, shall possess the necessary qualification for the work in hand before the vessel is allowed to clear. On British vessels more particularly tropical residents, old and young, are constantly passing to and fro under the charge of men to whom malaria is an unfamiliar disease; who have never heard of sprue; to whom dysentery is known from a general textbook merely; or to whom even Dhobhie itch conveys no meaning.

Apart from every other consideration also, the position of a young doctor, about to take up practice in a warm climate, is quite different if he has had even a short training in the work he must undertake. Without such education he is in doubt and trouble as to the correctness of his diagnosis and treatment for at least a year after taking up practice. In such a frame of mind his work can be no pleasure to him, and, instead of laying up knowledge which adds to the stock of his experience and to his own value, he gets through his work with a self-accusing consciousness that he is not properly equipped for his duties. No more galling or humiliating position can be imagined, and all the more keenly does it come home to him when he knows that it is by his own neglect that he is so situated. If trained in the elements of his profession as regards tropical medicine, he rejoices to meet with, and to be able to diagnose, new ailments; and, as his experience is built upon a sure foundation, he not only becomes early in his career a more valuable practitioner, but whilst young and fresh and vigorous is more likely to take a scientific interest in his work, without which practice in a warm climate is mere drudgery.

Article for Discussion.

THE DANGER OF SUBCUTANEOUS INJECTION OF QUININE.

REMARKS BY

L.—OSBORNE BROWNE, M.B.

Assistant Colonial Surgeon, Gold Coast.

IN your issue of October 1st under "Article for Discussion," "The Danger of Subcutaneous Injection of Quinine," I should like to state my experience of one case as far as I can from a rather vivid memory of it.

When practising in British Honduras a child was brought to me suffering badly from malaria. I decided to give the hypodermic method of quinine a trial, and made a solution of quinine sulphate with the aid of heat and *just enough* acid sulphuric dil. to effect its solution; for the purpose of this solution I injected the desired quantity—certainly not more than about 10 minims. The syringe was boiled, as was also the solution, and the skin washed with antiseptic lotion, so that there was no chance of infection with any living organism.

There was considerable pain after injection and the skin at the site became erythematous.

About a week afterwards the child was brought round by its rather indignant relative.

The fever has never recurred, but on the site of injection on the forearm was a sharply defined, deep and absolutely circular ulcer about the size of a florin or half crown, which took a long time to heal. I have since then injected as much as 20 grains of *quinine bihydrochloride* (compressed into one ounce cakes by Howard) into the gluteus maximus without the slightest ill result.

I believe that the acid used to effect solution is the cause of the necrosis, and would warn men injecting very insoluble salts which they dissolve themselves with acid.

II.—DAVID ALEXANDER, L.R.C.P., L.R.C.S.

(Late) Colonial Medical Service, Jamaica.

With reference to Dr. Townsend's letter on the "Danger of Subcutaneous Injection of Quinine," and your remarks thereon in your last issue, I venture to give my experience. My first trial

was in 1897, when I gave in an otherwise healthy patient two injections, one in the upper forearm, the other in the calf of the leg, using the following formula based on that in Burney Yeo's "Therapeutics":—

R̄ Quin. hydrochlorat.	...	...	...	gr. xv.
Acid. hydrochlor. dil.	...	...	...	m. v.
Aq....	...	...	...	m. xxv.

Over the sites of both injections troublesome abscesses formed, although I had been very particular with the syringe and the skin. The bad result here, I daresay, was due to the fact that the injections were not given deep enough. I had no occasion to make a further trial until the beginning of last year, when I used Benson's method as recommended in Dr. Manson's work. This I injected into the buttock, but with the same result. After this I tried solutions of quinine in hydrobromic acid and tartaric acid, with the same unhappy result. Since then up to the beginning of this year I have given eight or nine injections with good results, my procedure being as follows. I bought a new syringe which I kept for quinine injections only; before and after using each time I cleansed the needle and syringe carefully with carbolic lotion 1 in 20. In a test tube I boiled a sufficiency of water, and to this added the bisulphate of quinine, which is very readily soluble. The site was well washed with soap and water, then rubbed with spirits of turpentine, and finally with the 1 in 20 solution, and the injection given deep into the muscles of the buttock. The only untoward effects were a little pain and stiffness of the leg, but this only lasted for a day.

Translations.

THE TREATMENT OF CHYLURIA BY ICHTHYOL.

By Dr. MONCORVO, jun., Rio de Janeiro.

(Translated from the French by P. Falcke.)

UNTIL quite recently the treatment of chyluria, a disease that occurs frequently in the tropics, was limited to the use of empiric methods, or to symptomatic means of relief. For this purpose practitioners successively tried iron, astringents, arsenic, quinine, manganese, decoctions from the most diverse

plants, and hydropathic treatment; finally, as a last resource, the patient was advised to *return to Europe*, a step which up to the present is with justice considered to be the most potent factor in curing this complaint.

Lately, some doctors, influenced by the etiological history of the disease, were led to try parasitocidal drugs. The most various sequelæ have resulted from the use of terebenthinæ (Guyon), koussu, naphthol (Pacifico Pereira), and thymol (Lawrie).

Influenced by similar ideas, I was in 1896 induced to try methylene blue and asaprol (daily dose 4 to 6 grammes) in the case of a young man who was suffering from chyluria and whose general condition of health gave cause for uneasiness. These drugs, however, employed for the first time in a case of this nature, did not give satisfaction, for though they caused relief to a certain degree, definite recovery was only attained in consequence of a prolonged stay on the mountains in a cold district of the States of Minas Geraes.

Wishing to continue my therapeutical researches in this field, I recently resolved in analogous cases to study the action of a medicament, the germicidal and ischurctic properties of which had given excellent results in the treatment of lymphangitis, &c. The drug in question is *ichthyol*, and it was not long before I was able to prove its efficacy in two cases of chyluria, the favourable issue of which has led me to publish my experience.

CASE I.—Male, aged 21, a white, a Brazilian merchant, who sought my advice on March 2nd, 1897, for hæmatochyluria, from which complaint he had been suffering for the last four months, and which threatened to undermine his constitution. The malady, moreover, had been recently aggravated by the coincidence of blenorragia. Arsenic, terpinol, benzo-naphthol and asaprol were successively administered without producing the slightest improvement. On March 16th, I therefore began the ichthyol treatment in daily doses of $\frac{1}{2}$ gramme in the form of pills. This dose was increased two days after to 1 gramme, and later to $1\frac{1}{2}$ grammes per diem. After this treatment the urine became less and less sanguinolent, and in short, ten days later, it did not exhibit the slightest deviation from the normal. I should mention that on microscopically examining the clots before commencing the treatment, a large number of filarial embryos without movement were exhibited. As the urine regained its normal colour, so the blood and the chylous clots diminished proportionately. The local manifestations of the disease decreased, the patient's general condition improved, and his appetite returned. The drug was always well borne. At the end of six months no urinary trouble of any kind could be determined. At the present time my former patient is in excellent health.

CASE II.—Female half-caste, Brazilian, aged 25, married. Has suffered for over a year from marked and persistent chyluria. She consulted me on August 17th, 1897, on which occasion I examined the urine and confirmed the presence of blood and chylous clots which contained a number of filaria (Wucherer) which established the correct diagnosis.

The woman had tried several treatments and was

very discouraged at their uselessness. I immediately put her on ichthyol in pills, first in daily doses of 1 gramme, later on daily doses of 2 grammes. The drug was borne well, and improvement soon commenced to take place. At the end of twelve days all local and general symptoms had disappeared, and the urine had become of normal constituency.

The favourable and speedy results obtained in this case by the exclusive use of ichthyol have been maintained up to the present time. The woman regained her vigour, had an excellent appetite, and did not have any further urinary troubles.

These two cases of quick recovery from an intractable and parasitical disease seem to indicate ichthyol as a valuable therapeutical agent in the treatment of chyluria, which hitherto has proved rebellious to any means excepting change of climate.

A new path, therefore, seems to be opened to those doctors who have analogous cases to combat.—(*Bulletin général de Thérapeutique*, December 8th, 1897.)

UGANDA PROTECTORATE—REPORT FOR THE YEAR ENDING DECEMBER 31, 1900.

By Dr. R. U. MOFFAT, C.M.G.
Principal Medical Officer.

SURGICAL DISEASES.

THE native constitution possesses a capacity for repair after wounds which is nothing short of marvellous.

Injuries which, in a European subject, would unhesitatingly be pronounced as hopeless, or as necessitating amputation, will heal up in a native in a manner most embarrassing to the surgeon, who bases his prognosis on his previous surgical experience among civilised people.

Septicæmia and pyæmia are almost unknown; tetanus is extremely rare. Only one case has come under my observation during the whole time I have been in East Africa, and in this case there was no wound to account for it.

True phlegmonous erysipelas is also, I think, unknown, and anthrax and glanders I have never met with.

For all these reasons there should be a grand field for surgical work among the natives of this country.

As a matter of fact, very little has been done in this direction by Government medical officers, owing, no doubt, in a great measure, to the unfavourable conditions in which most of them are placed, having no skilled assistance and no means for enforcing proper care and attention in the after treatment. For this reason, it would appear that very few medical officers undertake much surgical work, except in those cases in which it is absolutely necessary in order to save life.

I will just shortly indicate the commonest surgical affections which come under our notice.

Localised, more or less superficial, inflammations and suppurations are very common, such as whitlows, buboes and abscesses. Ulcers of all kinds account for probably 50 per cent. of our cases of a surgical nature.

The skin of the black man appears to be particularly prone to ulceration, and one sees in this country a sloughing form of ulceration such as I have myself never met with elsewhere.

The best treatment for these is to rub the sloughing surface energetically with pure carbolic, and then to apply a wet dressing of lint, covered with gutta-percha. This should be changed every few hours. The applications of carbolic generally need to be repeated for five or six days. For ulcers of all kinds, nothing I find answers so well as the wet dressing.

Diseases due to parasites, specific organism, &c.

Tubercular disease of a surgical nature I have never met.

The chiggoe (or sand flea) still flourishes throughout the Protectorate, but its ravages are now not serious. It was introduced into Uganda from the west in the beginning of 1893. Curiously enough, Stanley's Emin Relief Expedition was credited with the onus of responsibility for having brought it through from the West Coast. Whether this was so or not I cannot say, but it is no doubt indirectly true, for since that time there has been increased inter-tribal communication, and this would, of course, lead to the spread of this pest. For the first two years after reaching Uganda its ravages were so terrible that it assumed the dimensions of a veritable plague. Many hundreds of people lost one or more toes, and I should think half the population were temporarily incapacitated for longer or shorter periods.

It would appear that when first introduced into a country its effects are much more virulent than they subsequently become. Though still extant in the Uganda Protectorate, the chiggoe does not now give much trouble.

The guinea worm abounds in the Nile Valley below the Albert Lake, but does not occur in Unyoro or Uganda, except in people who have lately come from the infected district.

Filaria Sanguinis.—None of the filariæ exist, to my knowledge, in the Uganda Protectorate. On the coast the *Filaria Nocturna* is common, and one not unfrequently finds it in Swahilis and other people temporarily residing in the Uganda Protectorate.

Bilharzia.—I have had two cases of this disease during the year. Both were Swahilis, and it is impossible to say where they contracted it. It is found on the coast, and I am inclined to think it does exist also in Uganda. Very many cases of unexplainable bladder hæmorrhage have at times come under my notice on occasions when I was unable to examine the urine microscopically.

Mycetoma and actinomycosis I have not seen, though there is a disease which bears a certain resemblance to the former. The Swahilis call it "miti" (pronounced "emte"). It consists of a brawny thickening of the affected limb, usually the leg. At certain points a sort of slow suppuration occurs. The skin eventually ulcerates, and a thick pus is discharged, after which an irregular sinus persists; often these burrow and communicate with each other. The disease is very chronic, and seems to go on for years.

I have found energetic local treatment does sometimes effect a certain amount of cure. I generally slit up the sinuses, and, if necessary, scrape their

walls. Then scrub them freely with pure carbolic, after which stuff with iodoform gauze. I have seen great improvement follow after such treatment, but it is very apt to recur. Prolonged rest in bed, if it were possible to enforce it, might assist.

Snakes.—Although there are many snakes throughout the country, we seldom hear of fatalities.

One fatal case occurred in Kampala this year, but it was not reported to me till the man was dead. He had been bitten twelve hours previously.

I have had five other cases during the year, all of which recovered. In no case was the snake killed, and it is possible that they were not of a very venomous nature. In two cases there was a certain amount of after swelling and pain. The treatment I adopt is to incise the point of puncture and to rub in some crystals of pure *pot. permang.* I also inject a solution, 1 per cent., round the wound, especially on the proximal side. This treatment is, of course, useless unless the patient is seen very shortly after the bite.

Veneral Disease.—Is excessively common both among Europeans and natives. It appears to be rampant among the Waganda, but I am not aware whether other aboriginal natives are much affected. If not, it will soon spread among them with the advance of civilisation, for every Government station unfortunately acts as a disseminating centre, owing to the fact that the coast natives employed are almost all more or less affected.

Gonorrhœa is especially common. In itself it appears to give very little trouble to the native, but in a very large percentage of cases epididymitis and orchitis result. This is no doubt due to their carelessness; in many cases they only seek treatment when some such complication has supervened.

It is a curious fact that though gonorrhœa is so very common stricture of the urethra is exceedingly rare. I am inclined to attribute this to the size of the parts. In regard to treatment I can recommend the practice of irrigation. The actual solution used is of no great importance. I generally use boric acid or zinc sulphate, and the urethra is washed out morning and evening with a pint of solution. This is much more effective and reliable than the syringe, the working of which it is difficult to explain to a native. I am now using specially made tubes, perforated near the tip, which is bulbous. When this is not available an ordinary small size catheter serves almost as well. After connecting it with a reservoir it is passed down as far as the triangular ligament, and the fluid runs out from behind forwards.

Syphilis is very common, with secondary and tertiary symptoms of all kinds. It is difficult to persuade natives to continue treatment when all symptoms have subsided. Many cases of advanced syphilis come under observation, in which there has been no previous treatment, and in consequence the manifestations are often much more severe than those now generally seen in civilised countries.

Soft sores and buboes are excessively common, especially among the uncircumcised natives.

The Masai and Nandi practise this rite, but none of the more western peoples in the Uganda Protectorate follow their wise example.

As far as I know the upper Nile tribes are also uncircumcised, except where they have come under Mahomedan influence from Egypt.

Diseases of special tissues and parts:—

Bones.—The commonest affections of the bones are periostitis and osteitis, generally of a syphilitic nature.

Caries and necrosis are seldom met with, except as a result of injury. Tubercular caries I have never seen.

The same can be said in regard to the joints. Chronic rheumatic affections are common enough, but, unless as result of injury, I have seldom come across acute arthritic disease.

Chest.—Surgical diseases of the chest are also rare, except such as are due to traumatism. I had one case of pyo-pneumothorax this year in Kampala in a patient with advanced phthisis, but otherwise I have never seen non-traumatic empyema.

Abdominal Diseases.—Hernia, umbilical and inguinal, are common, but otherwise surgical diseases of this tract are uncommon. Typhlitis and appendicitis do occur, but rarely. I have had two cases this year of acute general suppurative peritonitis, for which no cause could be traced at the *post mortem*.

Hæmorrhoids are very common among Europeans, but seldom occur amongst natives, probably owing to the fact that they are little troubled with constipation, in this respect their habits being most regular.

Fractures and dislocations are astonishingly rare, due, no doubt, to the fact that there are no beasts of burden, no wheeled traffic, and no machinery. The bones of a native must also be very strong, for an ordinary fall will scarcely ever result in fracture.

Diseases of Special Senses.—External diseases of the eye are very common.

Cataract is, in my experience, rare, but I am informed by the Mission doctors that in their practice it is excessively common. I myself have had only two cases this year. Amongst the natives errors of refraction are either rare or else it is a condition which does not trouble them much, and, in consequence, they do not seek treatment.

Ear.—Inflammatory conditions of the external and middle ear are common enough affections. The hearing of natives is, as a rule, excessively acute, and I have seldom come across any other diseases in this region.

Nose.—I have nothing to note in regard to the nasal tract beyond the fact that polypi are apparently very uncommon. I have never seen any myself, and no cases have been reported to me.

Male Genitals and Urinary Tract.—Non-venereal affections of this tract are not of frequent occurrence.

Stricture of the urethra is, as has been stated, rare.

Chronic enlargements of the testicles are very common, but they are usually due to gummata or chronic gonorrhœal inflammations. Hydrocele is most common, but seems to be permanently curable by simple tapping. Calculi in the bladder or kidneys are of very rare occurrence.

Diseases of Women and Obstetrics.—As stated before, Government medical officers have very few opportunities for practice of this kind. The Mission doctors,

however, inform me that they have a large amount of it among the Waganda, and that the diseases and complications which occur in no way differ from those of civilised life.

New Growths.—My experience in this connection illustrates the truth of my remarks in the preliminary observations of this Report. The Mission doctors inform me that in their practice new growths of all kinds are as common as at home. My own experience is exactly opposite.

I have seen during the eight years I have been in East Africa only one case of malignant growth. This was a scirrhus cancer of the breast in a woman at Mombasa. Small fibroid, fatty, and cystic tumours are not uncommon, but otherwise I should have said that neoplasms, both malignant and benign, are excessively rare.

A fatal case was reported to me from Unyoro this year as due to cancer of the stomach, but there was no *post mortem* so that the diagnosis was uncertain.

News and Notes.

THE GUIMAR HOSPITAL FOR THE PURE-AIR TREATMENT OF TUBERCULOSIS, GUIMAR, TENERIFFE.—In the notice we gave of this Hospital in the JOURNAL of August 15th, 1901, the impression conveyed was that the Hospital was only about to be opened. We beg to correct this impression, and to state that the Hospital is in full working order, and that patients are being received there regularly. The authorities draw particular attention to the fact that the Hospital is favourably situated as a sanatorium for persons invalided from the West Coast, more particularly from "fever." Although mosquitoes abound in the island malarial fever is unknown. The beauty and salubrity of Guimar, Teneriffe, will certainly attract invalids from all parts of the world.

Current Literature.

PRELIMINARY NOTES ON THE INTERMEDIARY HOST OF *FILARIA IMMITIS*, LEIDY.

By THOMAS L. BANCROFT, M.B. Edin.

Filaria immitis is a large worm-parasite of the dog, common throughout the world, especially in the warmer parts; it is from five to ten inches in length, the males being much smaller than the females; it takes up its abode generally in the right ventricle of the heart and in the pulmonary artery. These worms are very prolific, producing large numbers of young, the so-called embryos; the latter swim about in the blood, a single minim of blood frequently containing twenty or more of them, the number depending, of course, on the number of fertile females in the dog; the embryo is about $\frac{1}{10}$ inch in length by $\frac{1}{320}$ inch in breadth.

That distinguished scientist, the late Dr. Spencer

Cobbold, taught us that an intermediary host was necessary to transmit the parasite from dog to dog, and his opinion was accepted as correct.

Many workers in various countries, more particularly Grassi, Sonsino and J. Bancroft, endeavoured to discover the intermediary host; the dog-flea, *Pulex serraticeps*, was suspected, but no one could trace the young filariae in its body after the blood containing them was digested. The different dog lice and ticks were likewise examined but with negative results. The writer has been endeavouring for the past thirteen years to find the intermediary host; at first numerous examinations of the *Pulex serraticeps* were made, afterwards of the common horse fly *Stomoxys* sp. ?; *Culex vigilax*, Skuse, a day-flying mosquito; the intestinal worm-parasite of the dog, the *Anchylostoma* or *Dochmius trigenocephalus*. All these animals abstract together with blood the embryos, but the latter appear not to enter upon a metamorphosis, and after several days can no longer be traced; it is thought that they are digested.

It occurred to me as possible, that a metamorphosis was not necessary, but merely that the embryo should go through a cold stage for a few days in the body of an insect, after which should it gain entrance into a dog it would start upon its final development. To test this hypothesis, a feeding experiment on a puppy was made. The dog swallowed at various times during a month 110 *Stomoxys* flies gorged with filariated blood; in each fly there were about fifty embryos. Every month afterwards the dog's blood was submitted to microscopic examination; at the expiration of eight months two embryos were detected on a slide containing two minims of blood; a month later there were ten embryos in the same quantity of blood; the number, however, after this date did not increase; the dog was killed and search made for the mature worms—three only were found in the heart, two females and a male. Now were the hypothesis correct we should expect to have found hundreds of mature worms. This dog must have been infected whilst with its mother; it was three or four months old when I got it, and whilst under observation it was kept apart from other dogs. The experiment not only disproved the hypothesis, but served another purpose, viz., the time taken by the young filaria to arrive at sexual maturity was ascertained to be not less than seven months and not more than a year.

In the *British Medical Journal*, Nov. 3rd, 1900, p. 1306, there is a paper by B. Grassi and G. Noè of Rome, entitled "The Propagation of the Filariæ of the Blood exclusively by means of the puncture of Peculiar Mosquitoes." In this paper mention is made that Grassi, whilst engaged experimenting with the malarial mosquito, the *Anopheles maculipennis*, Meigen, Syn. *A. claviger*, Fab., had observed filariæ in them, which he traced to be developmental forms of *Filaria immitis*. To Grassi therefore is due the credit of having discovered the intermediary host.

The authors of this paper remark: "The embryos of *Filaria immitis*, sucked up with the blood by *Anopheles*, migrate into the malpighian tubes, where they continue their development, behaving more or less like the other blood filariæ already known. The larvæ, arrived at the maximum development possible in the body of

Anopheles, abandon the malpighian tubes to enter the general cavity of the body, leaving behind the old cuticle; then they progress towards the head, and collect themselves there rapidly (as our transverse sections show very clearly) in the prolongation of the general cavity of the body within the labium, called also inferior labium (exceptionally also in the palpe).

"By proper experiments we have demonstrated that when *Anopheles* bite these larvæ come out of the labium, and are thus inoculated in the bitten animal. The mechanism of exit represents one of the most singular and admirable phenomena that one can imagine for the diffusion of the parasites. . . . When the mosquito proceeds to penetrate the skin the labium buckles up at first towards the base, forming an obtuse angle. As the stylets gradually penetrate, the angle is advanced towards the middle of the labium, becoming extremely acute, so much so that when complete penetration is effected the labium appears doubled upon itself, forming a narrow kind of loop, and this forms, through the conformation of the parts which close together, a new canal. . . . It is certainly through the bending of the labium stuffed with filariæ that is brought about the rupture of the integuments of the labium; along the dorsal groove and through the rupture thus produced come out the filariæ to penetrate the body of their definitive host."

As the European mosquito, the *Anopheles maculipennis*, does not exist here, it is manifest some other insect must play the rôle of host in Australia. Early this year I was able to ascertain that the "House Mosquito," *Culex Skusii*, Giles, was the intermediary host. The embryos go into the malpighian tubes of the mosquito, as stated by Grassi, where they undergo a metamorphosis very similar to that of *Filaria nocturna*. In twelve days they have grown to a remarkable size and can be easily seen in the malpighian tubes and are capable of slight movements. In eighteen to twenty days they have arrived at maturity as far as their life in the mosquito is concerned; they have left the malpighian tubes and lie in the alimentary canal about the head, also in the labium; they are $\frac{1}{20}$ inch in length by $\frac{1}{80}$ inch in breadth.

If the proboscis of a filariated mosquito be cut off and mounted on a glass slide with cover-glass, and examined under the microscope, a slight pressure on the cover-glass being applied to cause the stylets to leave the labium, the young filariæ may be seen swimming up and down the apparent canal in the labium [what Grassi designates "the prolongation of the general cavity of the body within the labium"]; a little further pressure on the cover-glass causes the worms to escape at the extreme end of the labium. Whether there be a natural opening at the labellar end of the labium seems doubtful, but in every instance in which the experiment was made the young filariæ escaped at this point, and at no other.

In several works on entomology, giving descriptions of the mouth organs of dipterous insects [that are in my possession], there is no mention of a canal in the labium or of any opening at the tip. It seems to me that should no natural opening exist at the spot indicated, the young filaria would have very little difficulty in making one, and I believe that they

naturally do leave their intermediary hosts at this point; here they could wriggle into the wound made by the mosquito and would avoid any risk of being sucked up with the blood.

The young filariæ placed in water wriggle about but are quite unable to leave the spot where they happen to lie; it is not unreasonable to conclude that, as they are so helpless in water, they could scarcely swim against the blood stream entering the mosquito. There is still another objection to Grassi's idea of a rupture; this occurs when the labium is "stuffed with filariæ," but it would not be likely to happen when the labium contains a single worm as is frequently the case.

We are now able to give an exact account of the life-history respectively of *Filaria nocturna* and *F. immitis*. Starting with the sexually mature worms in man and dog, these produce embryos, which swim in the blood; the mosquito in biting abstracts some of the embryos; these develop in the mosquito's body and in about three weeks' time are capable of entering their final hosts should they get a chance of so doing. Sooner or later the mosquito may bite their final or definitive host, the filariæ seize the opportunity and pass into the puncture made by the mosquito in the skin; they now grow to sexual maturity, which probably takes about a year.

During the metamorphosis in the mosquito's body the position taken up by the filariæ serves to distinguish which is *Filaria nocturna* and which *F. immitis*, the former being in the thoracic muscles the latter being in the malpighian tubes; whilst at their maximum development the chief characteristic mark is their size, the young *F. immitis* being shorter and thicker than the *F. nocturna*.

We have learnt that mosquitoes live long periods, not a few days as was formerly thought but months, and that during their lifetime they bite frequently.

It is a remarkable fact that in Europe the *Anopheles maculipennis* plays the rôle of host for the malarial parasite, for *Filaria immitis*, and it is believed also for *Filaria nocturna*; whilst in Australia the "House Mosquito," *Culex Skusii*, Giles [formerly thought to be a form of *Culex ciliaris*, Linn.],¹ is host for *Filaria nocturna* and *F. immitis*, probably also for the malarial parasite.

I have recently found that dates, the dried fruit to be obtained from the grocer, are a most excellent food for mosquitoes, very much better than banana [which some years ago I had discovered to be a valuable food for mosquitoes in confinement]. Dates, as food for mosquitoes, have these advantages over banana, they may be kept in a jar in the laboratory and are conveniently to hand at any time; a pound weight of them will serve for numerous experiments; they do not go rotten or even mouldy; and there is no necessity, as with banana, to change for fresh every three or four days; a single date hung in the mosquito cage will serve throughout the experiment however long it might last. Mosquitoes fed on dates live longer, and many species that will not live in confinement more than three days on banana, e.g.,

¹ The "House Mosquito" of Australia appears to the writer to agree with the description given in Giles' work on Mosquitoes, p. 298, of *Culex fatigans*, Wied.

Anopheles musivus, Skuse, *Culex vittiger*, Skuse, thrive on dates and live for upwards of a month.

In studying the life-histories of mosquitoes it is often necessary to induce them to oviposit in confinement. I have found that when the water vessel in the cage contains putrid water mosquitoes will often oviposit whereas they refuse to do so on clean water. It is prudent, however, to remove the eggs to cleaner water as the larvæ of many species cannot exist in putrid water. The water may be rendered suitably putrid by the addition of a little fresh cow-dung.

In a number of experiments made with the object of ascertaining whether certain very rare mosquitoes [that would not live in confinement in glass jars of the capacity of a gallon of water] would live in larger cages and under more natural conditions, I made a cage having a capacity of about a cubic yard in which were several living plants in pots and large vessels of water both fresh and salt, but the mosquitoes lived no longer in it. It seems therefore that nothing is gained by the use of such large cages.—*Reprinted from Journal and Proceedings of the Royal Society of N. S. Wales*, vol. xxxv.

TROPICAL OPHTHALMOLOGY.

By M. T. YARR, Major, R.A.M.C.

NIGHT BLINDNESS.

DR. TRANTAS, ophthalmic surgeon to the National Greek Hospital at Constantinople, has published in the *Semaine Médicale* the results of his employment of "hepatic opotherapy" as a remedy for hemeralopia, or night blindness. In essential hemeralopia, that is to say, hemeralopia which is not symptomatic of retinitis pigmentosa, but which is observed in patients living under defective hygienic conditions, treatment usually consists in improving hygiene and alimentation, and administering tonic medicines, more especially cod-liver oil. Hippocrates recommended the ingestion of ox liver in large amounts as a cure for this disease; other practitioners in olden times also vaunted its efficacy, but in the present day it has fallen into disuse. Influenced by the success of modern opotherapy, Dr. Trantas determined to try this ancient nostrum in ten cases of hemeralopia which had resisted other forms of treatment, and was delighted to find a marked improvement in the night blindness commencing on the first or second day of administration, while the xerosis, which in some of the cases accompanied the affection, disappeared within ten to twelve days. No less than 200 grammes of boiled or roast ox and sheep liver were given daily. He attributes the success of this "hepatic opotherapy" to a regenerative action on the retinal pigment, and goes so far as to call the treatment infallible.

I have no experience of this form of treatment, which at first sight seems somewhat fantastic; however, Dr. Trantas is an ophthalmic surgeon and writer of established reputation, and any remedy which he extols as "infallible" deserves respectful consideration. In a paper contributed to the *JOURNAL* in April, 1899, I drew attention to the intimate connection between night-blindness, xerosis and keratomalacia,

and to their prevalence amongst the poorest classes in great towns in the tropics, such as Hong Kong and Bombay. All three appear to be ocular manifestations of general malnutrition. Mr. Sidney Stephenson, who has seen a great deal of xerosis amongst poor school-children in this country, considers it to be due to a bacillus—the "bacillus xerosis." Night-blindness without xerosis and without any other discoverable cause, such as retinitis pigmentosa, is, in my own experience, a very rare condition.

GLAUCOMA IN THE EAST.

Dr. Bitzos (Egypt) has an interesting monograph on "Primary Glaucoma in the East" in a recent number of the *Annales d'Oculistique*. Dr. Bitzos is an ardent advocate of the view that the fundamental and pathogenic lesion in primary glaucoma is a papillitis, leading to œdema of the vitreous by blocking the filtration channels which he contends exist in the papilla—a view which does not attract many adherents, and is unsupported by reliable evidence. Part of his paper is taken up with the exposition of this theory, but his description of the modified form of glaucoma seen in Egypt will prove of more general interest.

"The only evidences of glaucoma (*i.e.*, primary) observed in the East are glaucomatous papillitis and excavation, with the concomitant papillary and peripapillary alterations. Glaucoma in the East is, save in very rare cases, a mitigated disease, chronic, evolving very slowly and insidiously. It begins and progresses stealthily; the patient does not complain of pain, iridopsis (colours round lights), or any other distressing symptom; and if one eye remain unaffected he often only finds out by accident that vision is going, or gone, in the other. Examined objectively, a "glaucomatous papillitis" is found if the case be seen early, or a more or less considerable excavation if observed at a later stage. The glaucomatous halo is usually present but is relatively small. Hypertony (increased tension) is feeble but constant, rarely exceeding + 1. The iris is but slightly advanced, and consequently the anterior chamber is not noticeably shallower; as a rule the pupil is slightly dilated and its colour rarely indicative of glaucoma. The colour of the iris is seldom altered. Up to a certain point the visual field contracts concentrically; nearly always the last part to disappear is the temporal side. The glaucoma is, so to speak, simplified, and reduced to its essential elements."

Monsieur Bitzos finds the mean ocular tension low amongst natives of Egypt, and is inclined to attribute to this the relative infrequency of myopia and senile cataract.

MALARIAL IRITIS.

I have read with great interest Mr. White's excellent report of three cases of malarial iritis observed by him in Uganda and the East African Protectorate (*vide JOURNAL* of September 16th). Mr. White writes very judiciously, and is careful to avoid committing himself to a definite assertion of the exclusively malarial origin of the disease in his cases, but to my mind the evidence he adduces is conclusive in all three. That there is a specifically malarial form of iritis I am convinced, and Dr. White's paper goes

far to prove this. I am indebted to this gentleman for his flattering reference to my own contributions to the working out of this interesting subject.

TO AVOID "PRICKLY HEAT."—Not a few people are distressed during the hot months with an itching and burning sensation of the skin, accompanied by a fine eruption. This is caused by the perspiration, which cannot readily evaporate and thus produces the irritation. As stated in *Clin. Med.*, it will be found better to resort to soap and water, used frequently, and to avoid alcoholic and alkaline washes. Once a day, perhaps, the irritated parts should be gently bathed, then dried thoroughly, and afterwards anointed with cocoanut oil. It is absorbed readily and should be applied with the hand. It is not greasy and will not soil the clothing unless an excessive quantity is used.

Letters, Communications, &c., have been received from:—

- A.—Mr. G. Allen (London); Major W. Alpin, T.M.S. (Jhansi); Dr. David Alexander (Jamaica).
 B.—Dr. W. Leonard Braddon (Lerambau); Dr. Oswald Browne (Advie, N.B.).
 C.—Count de Cardi (London).
 H.—Dr. Harrison (Belize); Sir Clement Hill (London).
 M.—Dr. J. Preston Maxwell (South China); Dr. Massiah (Demerara).
 N.—Mr. W. A. T. Nottingham (W. C. Africa); Dr. H. Alford Nicholls (Dominica); Dr. G. H. F. Nuttall (Cambridge).
 P.—Dr. W. G. Tottenham Posnett (Bloemfontein).
 R.—Dr. Edw. Read (Lagos).
 S.—Dr. A. Sims (Matadi).
 T.—Dr. R. M. Townsend (Bulawayo).
 Y.—Major M. T. Yarr, R.A.M.C. (Dublin).

EXCHANGES.

Annali di Medicina Navale.
 Archiv für Schiffs u. Tropen Hygiene.
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 Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
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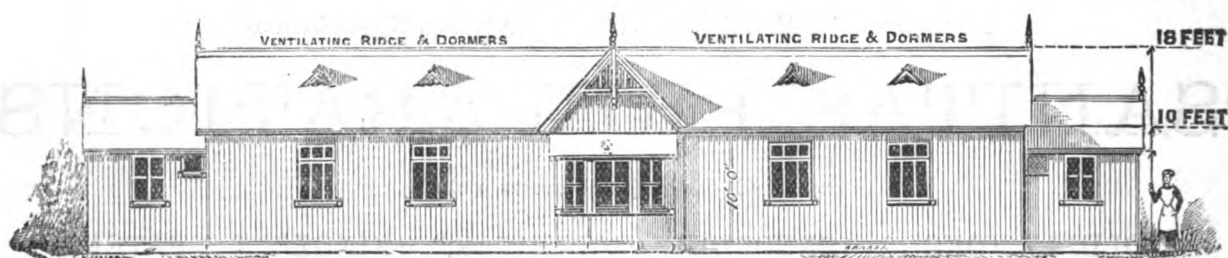
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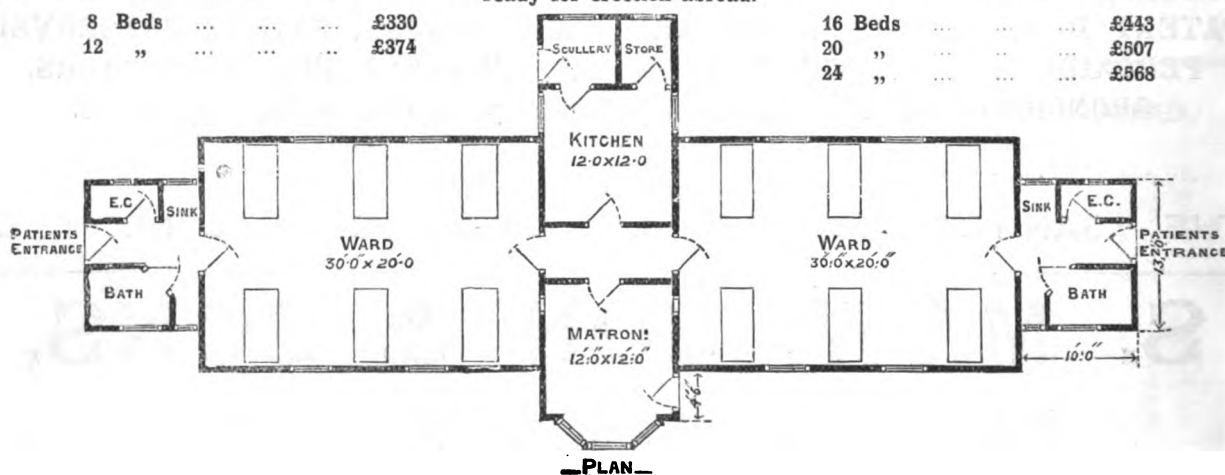


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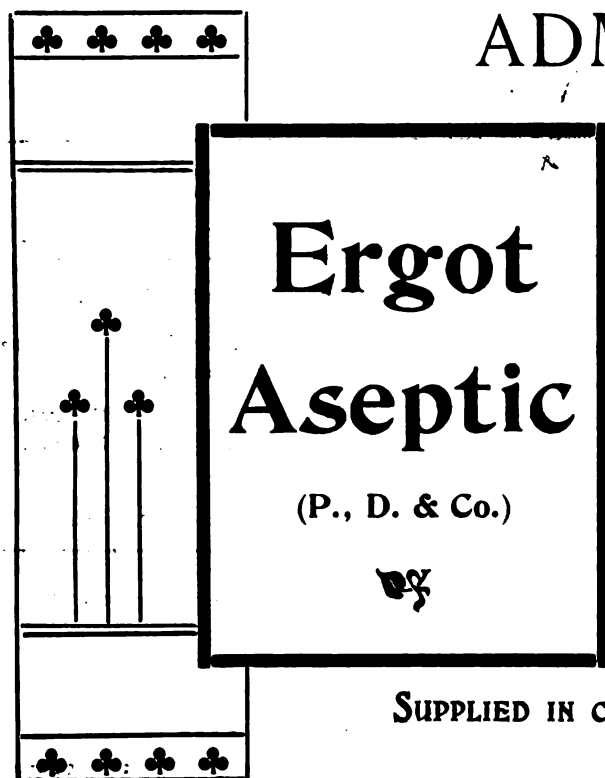
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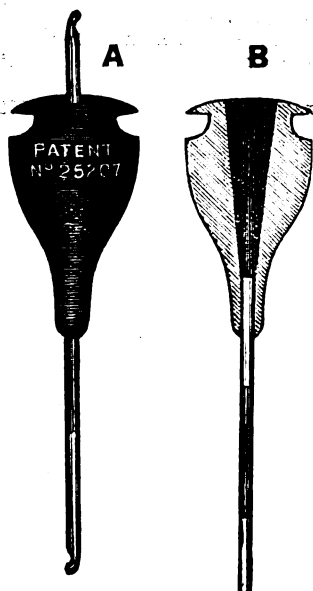
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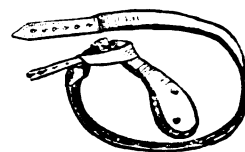
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BERI-BERI AND THE HEART.

By ARTHUR STANLEY, M.D., B.S.Lond., D.P.H.
Health Officer of Shanghai.

THE following observations have been made on a series of 341 cases of beri-beri during three years' work at the Municipal Isolation Hospital in Shanghai. The number of deaths in the series was seventy-two, the average time at which death took place after admission being twenty days. The cases were drawn from among the Chinese prisoners of the Municipality. There is no evidence of an exceptional incidence of beri-beri amongst the Chinese population generally, but the number of cases among native prisoners under foreign municipal supervision is excessive. The 341 cases were furnished from among 2,000 prisoners, 17 per cent. suffering from beri-beri.¹ What the factor is which causes this difference in incidence still remains undetermined. Overcrowding has been removed without any definite improvement; the source of food supply has been changed, beef has been added to the diet, and methods of strict isolation and disinfection of cases have been adopted, without diminution in the number of cases. The Chinese, though very careful with the storage of rice, especially when decorticated, do not recognise any disease as caused by its consumption. The prisoners get no alcoholic liquor. They have plenty of fresh air during the day, but are somewhat cramped at night; they have regular exercise, and as far as can at present be ascertained, good food.

With regard to the mode of onset and special symptoms, it would appear that the division into dry and wet, or into paraplegic and dropsical cases, is

misleading. Practically, all cases in the beginning had œdema (most easily detected along the flat of the tibia), and cases which became paralysed without previous œdema were rare. The œdema may be so slight as to be easily missed, unless especially looked for. It can, however, be understood that cases arising among prisoners always under medical observation afford exceptional opportunities for observing the disease from its onset. Among ordinary cases, treatment would often not be sought until paralysis had developed. As a rule, œdema along the front of the tibia, loss of knee-jerks, and the markedly abnormal heart condition mean beri-beri. Anæsthesia is a sign difficult of accurate delimitation among Chinese.

A patient examined soon after the onset of beri-beri has a full and rapid pulse of fair tension, the heart impulse exaggerated, and the first sound normal. Gradually, however, the toxæmic condition manifests itself; the first sign is the result of degeneration of the heart muscle, which, being less resistant than nervous tissue, precedes the action on nerve, shown by loss of motion, sensation and tendon reflexes. The heart signs are those produced by weakness of heart muscle, namely, lowered pulse tension, feeble pulse wave, feeble heart impulse, short first sound and accentuated pulmonary second sound. This condition of lessened heart-power may continue far into convalescence. Towards the end of the first month of the disease, what may be called the "beri-beri heart" is well established. The patient is pale and languid; the pulse is of low tension, the wave short and ill-sustained, of moderately increased speed, greatly accelerated by even slight movement, and sometimes irregular, both in rhythm and force. The superficial veins are rarely distended. The heart more often than not is of normal size, but may be dilated, the apex moving outwards. The cardiac impulse is usually feeble, and when there is dilatation, diffuse. Not rarely the heart's action is bounding and apparently forcible, but the actual circulatory output, as measured by the pulse, remarkably feeble by comparison, there

¹ The percentage of cases which occurred in the Japanese Navy prior to 1885, when the change to more albuminous diet was made, varied from 40 to 13 per cent. of strength.

being a marked difference between the violent over-action of the heart and the small feeble pulse. The first sound is short, the pulmonary second sound is relatively loud, and there is almost always reduplication of the second sound, most marked on listening over the third left costal interspace. Systolic murmurs are frequent, both at base and apex, and in the carotid arteries.

Changes in the length of the pauses of the heart cycle are frequent and of great importance in prognosis. Most common is a shortening of the long pause, giving rise to spacing of the heart sounds. The relative shortening of the long pause may be of all degrees up to "tic-tac" rhythm, where the short equals the long pause, so that the heart sounds are equi-distant. The change in the relative length of the two pauses is almost always accompanied by a change in the character of the sounds, the first sound becoming like the second in quality, losing its deep, so-called muscular sound, and making more audible the valvular sound, which resembles the ordinary valvular second sound. In this way the two sounds and the two intervals tend to become alike. This "tic-tac" rhythm, caused by the shortening of the long pause—the recuperative interval—points to diminished cardiac recuperative power and indicates danger ahead—danger of heart-failure. But of worse prognosis is that condition where, in addition to the long pause being shortened, the short pause is likewise shortened, so that the second sound follows very closely on the first. This condition is almost always a fatal sign, and occurs with or may be followed by heart-failure.

A condition characterised by what may be termed delayed beats, or "tumbling" rhythm, is a common form of irregularity of the heart's action in beri-beri. After a series of regular heart beats a pause occurs, followed by a sudden scramble of two or more heart beats, in order, as it were, to make up for lost time. This gives rise to an intermittent pulse, because all the beats do not reach the wrist.

HEART-FAILURE.

As in diphtheria so in beri-beri, sudden heart-failure is the most terrible complication, and one in which as a rule no treatment is available in preventing death. So marked a feature is this of beri-beri that the Japanese have given the name of "Shiō-shin" (signifying literally "heart-stroke") to this mode of fatal termination. Beri-beri and diphtheria are the diseases *par excellence* in which sudden heart-failure manifests itself. And this connection with diphtheria—a disease which is also associated with peripheral neuritis—is a suggestive leading motive in etiology. In beri-beri, as in diphtheria, the occurrence of vomiting is almost the invariable herald of a rapid fatal termination by heart-failure.

Heart-failure is usually made manifest by the following symptoms—post-sternal pain, restlessness, lilac-tinted pallor, vomiting, dyspnoea and irregular respiration, increasing weakness of the pulse and coldness of the extremities. These symptoms occurring together denote a fatal termination. The syncopeal attack is marked rather by duration than by intensity; loss of consciousness is rare. The date of onset of heart-failure is most commonly towards the end of the

first month of the disease and, as a rule, before any skeletal muscular paralysis is obvious.

Heart-failure is always preceded and accompanied by changes in the heart rhythm. The first pause is usually shortened so that there is a rapid sequence of the second sound after the first. The condition is frequently preceded by apparent spacing of the sounds, the result of shortening of the recuperative interval. Some dilatation in the heart is frequent but not invariable. Reduplication of the second sound is common; reduplication of the first sound is not unusual, and the cause of cantering rhythm.

A TYPICAL CASE OF SUDDEN HEART-FAILURE (SHIÖ-SHIN) IN BERI-BERI.

Chang Kee, male, Chinese, aged 30, coolie in a Ginseng shop, and for last two months a convict in the Municipal Gaol, was admitted to the Shanghai Municipal Isolation Hospital on September 21st, 1900; died October 20th, 1900.

Before admission to hospital he had swelling of the legs for one week and some epigastric pain. Two weeks after admission the patient was apathetic, face pale and puffy, and the oedema general, including the scrotum. There was no albuminuria. No sign of motor loss, but knee-jerks absent. No tenderness of muscles; some loss of touch sensation below the knees, difficult of accurate delimitation.

Three weeks after admission the pulse wave was short and ill-sustained—90 a minute, occasionally intermittent, tension low. On sitting up in bed the pulse was quickened to 130 a minute; wave and tension still more diminished, with breathlessness. Heart impulse feeble and diffuse when lying down but thumping when sitting up. Maximum impulse under the nipple. Deep cardiac dullness extended from one and a half inches outside vertical nipple line to the middle of sternum. There was no dullness to the right of the sternum in the fourth right interspace (right auricle). Auscultation near the nipple found the first sound muffled, short, and quickly followed by the second, which was relatively loud. There was a soft blowing systolic murmur at both apex and base but not in axilla. The second pulmonary was accentuated and the second sound reduplicated.

Thirty days after admission began to vomit, and complained of post-sternal pain; was more restless; lips became lilac-tinted; breathlessness increased; thumping over-action of the heart and epigastric pulsation. Deep cardiac dullness extended from two inches outside vertical nipple-line in fifth left interspace to one inch to the right of sternum in fourth right interspace. There was cantering rhythm of the heart due to reduplicated first sound; the second sound was also reduplicated. The pulse became increasingly weak and the extremities cold, death supervening within six hours of the onset of vomiting.

ANALYSIS OF 341 CASES OF BERI-BERI.

Fatal cases	72
Cases dying of rapid heart failure	31
Pulse tension lowered...	254
Dilatation of the heart	98
Second sound reduplicated	245
First sound reduplicated	85
Long pause shortened...	48
Short pause shortened	42
Cardiac murmur	84

DILATATION OF THE HEART.

Dilatation of the heart occurs more frequently in association with beri-beri than it does with diphtheria, and, considering the degenerated condition of the cardiac wall, the comparative infrequency may be explained by the low arterial pressure which obtains. In beri-beri, however, the process is a less acute one than in diphtheria, and, though the toxin produces similar changes in the heart muscle, it acts through greater periods of time causing more cardiac wear and tear. The special effect of both beri-beri and diphtheria on the heart is to produce a marked diminution of force leading to defective arterial pressure, hence the low tension pulse, and the frequency of syncopal attacks. Signs of cardiac dilatation may be marked by those of pericardial effusion. The degree of dilatation can be best measured by percussion of the deep cardiac dullness—the enlargement of this to the left being a fairly accurate index of the increased size of the heart. The superficial cardiac dullness merely shows how much of the surface of the heart remains uncovered by lung and is no index to its actual size. Dilatation of right auricle (easily detected by percussion of the fourth right interspace) and weakness of the right ventricle (detected by palpation of the epigastric region) are usually accompanied by considerable dyspnoea and often by some lividity. But it is the dilatation of the left ventricle which causes the urgent danger of death from syncope, and neglect of this indication may cost the patient's life.

CHANGES IN THE HEART-RHYTHM.

Changes in the heart-rhythm may be briefly stated as follows:—

- (1) Shortening of the long pause, giving rise to spacing of the heart sounds or "tic tac" rhythm.
- (2) Shortening of the short pause, the second sound following the first rapidly—a sign of grave import.
- (3) Lengthening of the long pause, causing infrequent heart-beat and slow pulse.
- (4) Laboured over-action or excited action of the heart, a condition of irritable weakness where there is much show of force but little result.
- (5) "Delayed" heart-beat occurring at rhythmic intervals and giving rise to intermittent pulse. "Tumbling" action of the heart—"hesitating heart" being a slight form of this.
- (6) Irregularity in force and frequency apart from above.
- (7) Reduplication of heart sounds, especially of the second sound. "Cantering rhythm," usually from reduplicated first sound—a fatal sign.
- (8) Murmurs.

Disturbance of the respiratory rhythm is an occasional accompaniment of change in the cardiac rhythm—such as sighing respiration, which is a bad prognostic; very slow respirations, with a normal pause between each; quick respirations, with a long pause between each; conditions also with a quick inspiration followed by a slow expiration; and again, typical Cheyne-Stokes breathing.

The frequency of the heart's action in beri-beri is almost always above normal, and, as a rule, the lower the arterial tension the greater the frequency.

The frequency of reduplication of the second sound

is remarkable. "Cantering rhythm," when present, is almost always accompanied by dilatation and followed by death; the canter is usually due to an apparent reduplication of the first sound, and when the three steps are equi-distant, death is near. To get etiological leading-motives, it becomes necessary to consider the mechanism of the changes in heart rhythm observed. In "tic-tac" rhythm, when the long pause or recuperative interval is shortened, a vicious circle is established. The heart is weak and is rendered still more so by diminished recuperative rest. The condition, therefore, leads to the still worse condition where the short pause is shortened, the second sound following the first sound more quickly than normal, due probably to the heart being brought up short by the resistance in front of it in the arterial system. Thus the condition tends to go from bad to worse, and, as in the heart it is "all or nothing," a stage is reached when the circulation can no longer be maintained and the heart ceases function suddenly—sudden heart-failure, the "Shio-shin" of the Japanese, whose literal translation is "heart-stroke."

Murmurs are frequent and are possibly due to some yielding of the mitral or tricuspid curtains, yet most usually come under the category of so-called "hæmic murmurs."

CONCLUSIONS FROM CLINICAL OBSERVATIONS.

Heart-failure may occur prior to any manifestation of disturbed innervation. As in diphtheria, so in beri-beri, heart-failure often supervenes before any paralysis has appeared—about the end of the first week in diphtheria, towards the end of the first month in beri-beri. The cardiac muscle is the prime factor in the circulation. The heart, in contradistinction to the skeletal muscles, partakes of the nature of an automatic mechanism, though influenced through the vagus and sympathetic nerves. No extra-cardiac trophic nerve to the heart is as yet known. To attribute heart-failure in beri-beri or diphtheria to a neuritis of the vagus is alike unnecessary, inadequate, and unproved.

To a certain extent heart-failure and changes in the rhythm occur in other acute specific diseases which do not, or only rarely, produce peripheral neuritis, such as typhoid fever, influenza, plague, and acute rheumatism. In these and in arsenic and alcohol poisoning a somewhat similar condition of the heart is found *post mortem*, as in beri-beri and diphtheria, namely, one of parenchymatous degeneration of the heart muscle. To explain the unusual frequency of heart-failure in beri-beri and diphtheria, it is necessary therefore to establish that the degeneration of the heart muscle is more marked in these than in other toxin diseases where heart degenerations are produced. *Post-mortem* examination does establish this. That the toxin of diphtheria has a special predilection for heart muscle is also borne out by experiments on animals. Alcohol is another toxin, the product of a micro-organism, which produces peripheral neuritis, and has a specific degenerative action on the heart muscle. Some cases of alcoholic neuritis with dilated heart and œdema are almost indistinguishable from beri-beri, and death may take place from sudden heart-failure. In arsenic neuritis also death not infrequently takes place from

sudden syncope, and localised œdema has been described.

Muscle is less resistant and therefore more quickly acted upon than nerve, and hence the heart changes occur, as a rule, at an earlier date than nerve degenerations. The results of muscle degeneration, through direct actions of the toxin, manifest themselves before those of muscle degeneration the secondary result of trophic nerve change.

The suddenness of the heart-failure does not, however, indicate a sudden lesion. In an involuntary muscular organ like the heart it is "all or nothing"; either it acts with sufficient force to maintain the circulation, or it ceases altogether, and often suddenly. The stoppage of the heart, though sudden, may therefore be really due to a gradual accumulative weakness, and this is borne out by clinical experience. That the heart-failure also is not due to a general loss of vitality, but rather to a specific effect on the heart itself, is evident from the marked distinction between the condition of the heart and the comparatively good general physical and mental condition even a short time before death from heart-failure.

In conclusion, the circulatory physical signs point to a weakness in circulatory power, due to primary degeneration of the heart muscle.

POST-MORTEM CONFIRMATION OF CONCLUSIONS FROM CLINICAL OBSERVATIONS.

Sidney Martin has shown¹ that the diphtherial albumoses produce an advanced degree of fatty degeneration in the heart muscle, and he was unable to find any degeneration in the vagus nerve. Mott² found fatty degeneration of the heart muscle in each of the four cases of diphtheria paralysis which he examined, but in only one of them was there degeneration of the peripheral nerves. Poynton³ has recently published a comparative study of the condition of the heart wall in diphtheria and rheumatism respectively, and has described very marked degeneration of many of the cardiac muscle fibres, and complete destruction of some parts of them. Mott and Halliburton,⁴ by making an alcoholic extract of the blood of a beri-beri case, filtering, evaporating to dryness at 40° C., dissolving the residue in normal saline and injecting into the jugular veins of an anæsthetised cat, showed that the blood contained a substance which, like choline, produced a fall of arterial pressure, slowing of heart's action and dilatation of heart. The beri-beri case was found *post mortem* to show extensive degeneration of the peripheral nerves and fatty degeneration of the muscles, including the heart. The substance in the blood therefore resembling choline may have been rather a product of this fatty degeneration.

Giacomelli⁵ has made a series of experiments on animals with the object of ascertaining the changes in the myocardium produced by various toxin diseases and poisons. More or less marked alterations were constantly seen, for the most part confined to the

heart muscle itself, sometimes, but rarely, affecting the interstitial connective tissue or the vessels. The changes in the connective tissue were generally associated with the presence of micro-organisms, and consisted of diffuse lymphoid infiltration. There was no causal relationship between the changes in the connective tissue and vessels and those in the heart muscle; the two existed independently. The changes in the heart muscle varied from simple atrophy to fatty degeneration and destruction. There were no definite anatomical lesions corresponding to definite specific poisons. The changes were due to the direct action of the bacterial toxin and poison on the muscle fibre itself, and were sufficient in themselves to cause cardiac failure.

On account of the insuperable difficulty of making autopsies on the Chinese subject it has been impossible to confirm these observations in Shanghai.

The importance of the clinical evidence of heart degeneration lies in the fact of the warning it gives and the possibility of preventing the onset of heart failure by an unusual degree of care with the object of saving the labour of the heart as much as possible.

Cardiac failure is undoubtedly the commonest cause of death in beri-beri, and this clinical association of beri-beri, diphtheria, influenza, alcoholism, and arsenic poisoning gives an important etiological clue, which in association with ergotism, pellagra and lathyrism, it is proposed to closely follow.

CONCLUSIONS.

(1) Beri-beri has a marked degenerative action on the heart muscle, which frequently causes fatal circulatory failure.

(2) In this respect beri-beri resembles other toxæmic diseases, such as diphtheria, influenza, and alcohol and arsenic poisoning, which often cause peripheral neuritis, and also other toxæmic diseases, such as typhoid fever, plague, and acute rheumatism, which do not or rarely give rise to peripheral neuritis.

(3) Beri-beri and diphtheria are the diseases *par excellence* in which sudden fatal heart-failure occurs.

(4) The heart muscle degeneration is not a secondary result of neuritis of the vagus.

(5) The heart muscle degeneration takes place as a rule before skeletal muscle degeneration, and is the result probably of direct action of the toxin, and not a secondary result of nerve change.

(6) Sudden heart-failure does not indicate a sudden lesion, but rather is the result of a gradually increasing heart weakness from cardiac muscle degeneration, which may be precipitated by any sudden exertion, but more frequently is the result of the principle of "all or nothing"—the transition from "all" to nothing being necessarily rapid.

(7) The cardiac physical signs in beri-beri closely resemble those found in diphtheria,⁶ and are of paramount importance in prognosis and treatment.

A PLANT that grows in India, called the *Philotacea electrica*, emits electric sparks. The hand which touches it immediately experiences a shock.—*Monthly Magazine of Pharmacy*.

¹ Goulstonian Lectures, 1892.

² Croonian Lectures, 1900.

³ *Lancet*, May 12th, 1900.

⁴ *Brit. Med. Journ.*, July 29th, 1899.

⁵ *Il. Policlin.*, An. viii., f. 3, 4.

⁶ *Metrop. Asylums Bd. Rep.*, 1897, p. 180.

British Medical Association.

A DISCUSSION ON MALARIA AND ITS PREVENTION.

(Continued from p. 341.)

IV.—THE INOCULATION OF MALARIA BY ANOPHELES.¹

By CAPTAIN C. F. FEARNSIDE, I.M.S.

THE Central Prison of Rajahmundri, Madras Presidency, is one of the most malarious gaols in India, and from the years 1880-1897 no less than 60 per cent. of admissions for malarial fever in all the larger gaols of this Presidency were accounted for by this prison. In no fewer than seven years, between the above-mentioned dates, the admission-rate from this cause exceeded 1,000 per mille.

In 1889 Dr. Manson suggested that I should make investigations to see how far the *Anopheles* mosquito was the bearer of the malarial organism. In November last I dissected forty free *Anopheles* which had at some time or other been feeding on the blood of the prisoners, and I found malarial sporozoites in one, that is, 1 in 40. The prevalence of malaria in Rajahmundri and its prison makes the experimental inoculation by *Anopheles* a difficult matter, and this point must be borne in mind dealing with the question. There are six varieties of *Anopheles* in Rajahmundri, and the one used was of a light fawn colour commonly found all the year round. The infected mosquitoes were kept in a Bohemian beaker, the mouth of which was covered with a piece of muslin. In this paper I have endeavoured to show that the zygote grows primarily in the epithelial layer of the stomach, and that it gradually pushes the middle coat outwards, and finally appears as a bud lying between the fibres of the outer or muscular coat.

The sporozoites are very numerous in the veneno-salivary gland from the tenth to twelfth day after infection. From the fifteenth day after haustellation the numbers decrease, so that there are few sporozoites in the gland on the nineteenth day.

The infected mosquito can only infect a limited number of persons, and, further, to give a successful inoculation a considerable number of sporozoites must be infected, because if a small number only find their way into the blood the phagocytes destroy them. Of seventeen *Anopheles* fed on blood containing summer-autumn parasites and crescents nine were found to contain Ross's cysts. The failures I have explained, and the conclusion is that seventy approximately became infected. Of seven fed on blood containing spring tertian parasites all became infected.

Eight persons were inoculated, and of these seven contracted fever. The blood on which the *Anopheles* fed originally was examined and the parasite recorded, the blood of the person inoculated was examined from time to time and also recorded. The incubation period is from twelve to twenty-five days for both types of fever.

My own case is the most authentic, because I have been in the best of health since 1891. The experi-

ment in the tropics is not without danger and inconvenience. From January till the second week in April I was always more or less ill and had occasional attacks of fever. What gave me most trouble was a catarrh of the bowel and loss of appetite, and I lost almost a stone in weight during that period. I have now been home two months and am as well as ever. Another "victim" had one of the severest attacks of malarial jaundice that I have ever met with in the tropics.

The presence of malarial zygotes in the stomach and of sporozoites in the salivary glands, the attack of ague soon after the bite, twelve to twenty-five days (incubation), the presence of similar parasites in the blood of the inoculated corresponding to those found in the blood of the person who was the source of the infection, is strong presumptive evidence that the fever was produced by the infected *Anopheles*.

The prevention of the spread of malaria by means of zinc-proof houses and mosquito curtains is out of the question in India. To put the native population—men, women, and children, who sometimes have only sufficient money to keep body and soul together—under mosquito nets and in mosquito-proof houses is impossible. The next suggestion one hears of is the destruction of *Anopheles*. If this is to be done properly the rice fields, which are the main source of food throughout a great part of India, will have to be abolished. Is the population to starve in the meantime? Famine has been quite bad enough in recent years without the abolition of these fields.

The last remedies are the freer use of quinine and the segregation of infected individuals. The former seems the more practical, but the segregation of infected natives will be as difficult a task as the wholesale slaughter of the *Anopheles*.

V.—NOTES ON CYPRUS FEVER.

By GEORGE A. WILLIAMSON, M.A., M.D.Aberd.

District Medical Officer, Larnaca, Cyprus.

THE mistaken ideas so prevalent in England with regard to the climatic diseases of Cyprus lead to the hope that the following few notes may not be without their use:—

What would be understood by a person unacquainted with the island and its diseases by such a term as "Cyprus fever"? Surely it would mean either a fever peculiar to Cyprus, or the fever most commonly met with there.

Now it should be fully recognised that there is no disease in the island peculiar to Cyprus; while the reports of medical officers in Cyprus, since the occupation in 1878 up to the present time, all go to show that malaria is the most common fever.

Nomenclature.

The giving of local names to diseases is confessedly a bad plan, as it so frequently happens that the disease in question is later on found to occur in many other places, in which case the original local name is plainly a misnomer. A typical example of this is seen in the affection now commonly called "Oriental sore," but which was formerly known by the titles, amongst others, of Delhi boil, Biskra button,

¹ This paper appeared in the "Scientific Memoirs by Medical Officers of the Army in India."

and bouton d'Aleppe; such a system must lead to confusion, and to give the name of "Cyprus fever" to any disease met with here would only be to fall into this mistake.

The Cypriotes frequently speak of "local fever" (*ἡ θερμὴ τοῦ τόπου*) meaning generally by this malarial fever, but the term is so loosely applied that it includes many diseases other than this, and is therefore of no value.

Dr. Carageorgiades, of Limassol, in his pamphlet "Cyprus Fever, or Febris Complicata in Cyprus,"¹ describes undulant fever, and distinctly states it to be so, as, amongst synonyms for Cyprus fever, he gives Mediterranean fever, Malta fever, rock fever of Gibraltar, and Neapolitan fever, all of which are universally acknowledged as being simply synonyms for the disease so well named by the late Major Hughes, R.A.M.C.,² "undulant fever." In this pamphlet reference is made to Dr. Veale's report on the fever to which he gave the name of "febris complicata." The identity of Cyprus fever (Carageorgiades) and febris complicata (Veale) with undulant fever (Hughes) is discussed and proved in Hughes's "Malta, Mediterranean, or Undulant Fever," and need not be further insisted on; as this disease is found also in at least the following countries: France, China, India, Africa, Greece, and Turkey, the title of Cyprus fever can hardly be regarded as deserved.

The Colonial Office printed in 1886, a "Report on the Fevers of Cyprus," by Dr. Heidenstam, the Chief Medical Officer.³ In this the fevers described are all malarial in their nature, comprising (a) intermittent (with varieties—algid, choleraic, apoplectic, pneumonic and neuralgic), and (b) remittent. The following paragraph from this report may be quoted here: "The difference existing between fevers consist principally in the cause from which the fever is derived. The intermittent and remittent are due to palus or paludal miasma known as malaria, and this is the principal form which exists in Cyprus, increasing or decreasing according to the circumstances favouring or dis-favouring their origin, and the assumption that those fevers may result from other causes than from infection of malaria is simply puerile, and not based on correct principles." Here Dr. Heidenstam gives it as his opinion that in his wide experience of Cyprus and its fevers, malarial fever is the principal form met with; he does not discuss undulant fever.

Personal Experience.

During my residence here since 1895, I have had excellent opportunities of studying the diseases of the country, and no special disease found here and here only has been observed. The "fevers" commonly met with are most certainly malarial, as proved by microscopical examination of the blood, as well as by the usual clinical signs; a febricula, to be described later on, is also common; undulant fever is met with

occasionally; no mention is made now of the exanthematous fevers, such as measles, which occasionally appear in epidemic form.

Febricula.

The febricula referred to above appears to be the same disease as the "ephemeral fever, febricula, or simple continued fever" described by Sir Joseph Fayrer⁴ as one of the fevers of India. In Cyprus it seems to be connected with the digestive system, the patient having complete anorexia, constipation, or more rarely diarrhoea, vomiting, white-coated tongue, headache; the raised temperature—rarely over 104° F.—lasts from two days to a week or ten days at most; complete recovery ensues; repeated examinations of the blood fail to show malarial parasites.

In the treatment quinine is unnecessary, except in tonic doses of a grain or two, and then chiefly after the fall of the temperature, when also cinchona bark, and ammonium carbonate are useful. An early purge followed by a diaphoretic mixture is all that is medically required during the height of the attack; for the headache, cloths wrung out of cold water may be applied to the head; liquid diet for two or three days will be necessary.

Reference to Captain Porter's article on "Simple Continued Fever in South Africa"⁵ will show that this simple fever is common in South Africa also, and it will be noted that the treatment recommended by Captain Porter is much the same as that mentioned above. It is worthy of mark that this disease occurs in places so widely apart as India, South Africa, and Cyprus, and therefore cannot be called "Cyprus Fever."

Undulant Fever.

Undulant fever undoubtedly does occur in Cyprus, but is not common. During the first six months of this year only one case has come under my notice. It should be noted that the differential diagnosis between this and enteric fever is at times very difficult, chiefly in cases of enteric fever where, as frequently happens in warm climates, constipation rather than diarrhoea is a marked symptom.

Malaria in Cyprus.

With regard to malaria, it is admitted on all sides that the pernicious malarial fevers are now not nearly so frequently met with as formerly, and this amelioration is ascribed chiefly to two factors: (1) The draining and filling-up of marshes; and (2) the planting of trees in places which were formerly marshy grounds. The principal forms of malaria met with are tertian and quartan fevers (the varieties of these, double tertian and double and triple quartan, being included and not separated as quotidian). Experience in these forms impresses one with the fact that quartan is a much more difficult fever to cure permanently than tertian, attacks—evidently returns and not fresh

¹ "Cyprus Fever, or Febris Complicata in Cyprus," by John Carageorgiades, M.D., K.M., &c., Limassol, Cyprus, 1891.

² "Malta, Mediterranean, or Undulant Fever," by M. Louis Hughes, Surgeon-Captain, Army Medical Service, London, 1897. With special reference to p. 10 of that book.

³ "Report on the Fevers of Cyprus," by Dr. F. C. Heidenstam, C.M.G., Chief Medical Officer of Cyprus. Colonial Office, May, 1886. Mediterranean. No. 23.

⁴ "The Climate and Some of the Fevers of India," by Sir Joseph Fayrer, Bart., M.D., F.R.S., &c., on page 314 of "Allbutt's System of Medicine," vol. ii.

⁵ "Simple Continued Fever in South Africa," by Captain F. J. W. Porter, R.A.M.C., *British Medical Journal*, June 15th, 1901, p. 1,470.

infections—occurring after intervals of time amounting even to months. This frequency of quartan fever may be accepted as evidence of the island not being a country dangerous to Europeans on account of its malaria as it has been found, and the fact is regarded as an axiom that where quartan fever is common the fatal forms of malaria are more rarely met with.

From February 12th to June 30th, 1901, I examined the blood of ninety persons whose symptoms suggested they might be suffering from malaria or from some other disease complicated with malaria, and Table I. shows the result of this examination. The first case presenting crescents in the blood was observed on June 20th.

Table I.

Number of persons examined	90
Number of cases diagnosed as malaria, of which 7 had been under quinine before date of examination	42
Parasite of quartan fever found in	8 cases.
" " benign tertian fever found in	12 "
" " æstivo-autumnal fever found in	4 "
Small ring forms, variety not recognised, found in	8 "
Pigmented leucocytes only found in	2 "
Diagnoses, other than malaria, in 48 cases were febricula, gastritis, phthisis, bronchitis, dyspepsia, anæmia, supraorbital neuralgia, debility, puerperal fever, pleurisy, abscess, diarrhoea, enteric fever, hepatic congestion, tonsillitis, undulant fever.	

Table II.

Number of persons treated	1,316
Number of cases of malarial fever	55
" " febricula	29
" " undulant fever	1

Table II. shows the prevalence of the various diseases, malarial fever, febricula and undulant fever, among 1,316 persons treated for different diseases from January to June, 1901. This clearly shows that febricula and malaria were the diseases (of the three mentioned) most commonly seen, and the frequency with which quartan and benign tertian fevers were met with in comparison with æstivo-autumnal fever will show that it is the milder forms of malaria that are common, at least during this part of the year, and the small proportion of cases of malaria to other classes of disease (these are precisely what are met with in the ordinary run of practice in the United Kingdom) will tend to show that Cyprus is far from being the fever-stricken island it is sometimes supposed to be.

Mosquitoes.

No reference to malaria would now be complete without a word as to mosquitoes. There are numbers of mosquitoes—too many for comfort—in Cyprus. The common mosquito, breeding in pots, petroleum tins, &c., containing water, is of the genus *Culex*. Much less common is the *Anopheles*, in some places apparently unknown, perhaps because not carefully looked for. The first locality in which I found the *Anopheles* larva was in the neighbourhood of new irrigation works, where malaria had been extremely prevalent, and here the larvæ were found not in the reservoirs, but in small artificial pools of clear water formed by the removal of the soil for use in making embankments. It is satisfactory to know that these pools have now been filled up and these breeding places for

Anopheles done away with. So far I have met with two species of *Anopheles*—one was evidently *Anopheles maculipennis*, the other was not recognised.

Conclusion.

My hope in submitting these fragmentary notes was to be able to show:—

(1) That there is no disease found in Cyprus, and there only, to which the name "Cyprus fever" might be given.

(2) That the forms of malarial fever met with most commonly in the island are those least fatal.

(3) That febricula, the other fever so frequently met with, is not dangerous to life.

Finally, I would urge that the term "Cyprus fever" be abolished, as its retention, even among medical men practising in the island, can only lead to confusion.

VI.—MALARIAL AND FILARIAL DISEASES IN BARBADOES, WEST INDIES.

By GEO. C. LOW, M.A., M.B., C.M. Edin.

Craggs Scholar, London School of Tropical Medicine.

THE analogy between malaria and filariasis is in many ways a close and interesting one, both, as far as the tropics are concerned, being very often found co-existing in the same districts, and both being spread from man to man by their own special species of mosquitoes. It is therefore interesting to be able to point to a tropical island, namely, Barbadoes, in which the former is non-existent, while the latter is extremely prevalent amongst all classes of the community. The reason for the presence of the one and the absence of the other is supplied by the fact that *Anopheles* mosquitoes, the definitive host of the malarial parasite, are not found in the island, whereas *Culex fatigans*, one of the suitable intermediate hosts of filaria nocturna, abounds.¹

Before considering certain local features of those two infections, a brief description of the physical characters of the island may be given with advantage.

Description of the Island of Barbadoes.

Barbadoes, the most easterly of the Caribbean Islands, lies well in the ocean by itself in latitude 13° 4' north, and longitude 59° 37' west, about 100 miles distant from St. Lucia and St. Vincent. It measures 21 miles long by 11 miles broad, and comprises an area of 166 square miles, six-sevenths of which consists of a formation of coral limestone, the remaining one-seventh being formed of different geological strata, namely, the Scotland series, consisting of sandstone and dark clays, and the oceanic series, consisting of white earths and chalks.² The surface is more or less flat, the land rising gradually towards the centre of the island into two ridges, one of which running east and west, attains a height of 400 feet above sea-level, while the other to the north of this is about 1,000 feet high.

The population of the island numbers 200,000,

¹ *British Medical Journal*, June 1st, 1901.

² "The Geology of Barbadoes," Harrison and Jukes Brown, 1890.

30,000 of those living in Bridgetown, the chief town, and 1,500 in Speightstown, the second town, while the remainder are scattered about in separate huts and hamlets, or in small villages.

With the exception of one or two springs, which bubble up and find their way into the sea within a few hundred yards of their origin, there are no rivers, the water supply of the town being obtained by boring into the large subterranean reservoirs of water which exist underneath the coral.

Several ponds and larger collections of water are found at different parts of the islands, two such existing at Speightstown and Holetown respectively; three miles south of Bridgetown there is a permanent swamp.

In addition to these there is a creek communicating with the harbour, which runs inland for some distance in the centre of the town, and another swamp at the south of the island. The water in the latter, however, disappears during the dry season. After heavy rains, and during the wet season, various collections of water are found in hollows and other situations chiefly along the coast. The whole island is practically under cultivation, sugar cane being the staple product. Two seasons may be distinguished, a wet and a dry; the former in summer and autumn, the latter in winter and spring. The average rainfall is about 60 to 70 inches a year.

Malarial Fever.

On arriving in Barbadoes, and talking with the medical men practising in the town and island, all were unanimous in the statement that indigenous malarial fever does not exist in the island. Cases are frequently met with in the General Hospital; all of these come from some of the neighbouring islands where malaria is very common. No one could point to a case which had originated in the island itself.

The interesting question now arises, Are any mosquitoes of the genus *Anopheles* to be found in Barbadoes or not? As may be gathered from what has been already stated, the features of the island do not lend themselves very readily to the production of suitable breeding places for these insects, with the exception of the swamp at Worthing, three miles south of Bridgetown. This swamp is situated at the foot of some elevated ground quite close to the sea, with which it communicates by a canal, the exit, however, being very often blocked up with sand thrown up by the surf. It covers a considerable area of ground, and is divided up into canals and ponds with roads and paths running through it in various directions. The water, especially in the part near the outlet, is slightly brackish, and in parts it is very stagnant, smelling strongly of sulphuretted hydrogen, resulting from the decomposition of vegetable material. It is probably fed by springs of water, rain, and other collections, which percolate from the neighbouring high ground. The surface of the water at many places is covered with algæ of various sorts and other forms of aquatic vegetation. On looking at it, it certainly appears to be a spot favourable for the development of *Anopheles* larvæ, but although

larvæ of a species of *Culex* and those of dragon-flies and other aquatic insects were always found in abundance, no *Anopheles* larvæ could be discovered. Confirmatory evidence of this was found in the fact that the people living in the vicinity never suffered from fever, but enjoyed remarkably good health. It is probable, from the close similarity of this place to *Anopheles*-infested swamps in the other and neighbouring islands, that such larvæ could live here perfectly well; whether they have ever been here and have died out, or whether they have never existed is a matter of speculation.

An examination of the other swamp at the south end of the island was not very hopeful, as at the time of my visit it had only filled up with water after some heavy rain, and contained practically no algæ or other vegetation; no *Anopheles* larvæ were found in it, the only result of my search being a species of *Culex* in small numbers. The creek in the centre of the town is very dirty and muddy, and is really an arm of the sea fed at its upper end by rain and other waters. Several examinations produced no larvæ of any sort, the water being probably too dirty for anything to live in. All the various ponds, springs, and other collections of water, though often having plenty of suitable vegetation in them, gave similar results; in some larvæ of *Culex* were found, in others nothing.

These observations coincide with the researches of Mr. Lefroy, Entomologist to the Imperial Department of Agriculture, who has also made a systematic search for *Anopheles* larvæ with negative result.

The conclusions reached, therefore, bear out that suggested by the epidemiological fact that there is no malarial fever in the island, and once more go to prove that without mosquitoes of the genus *Anopheles* no malarial fever exists.

Filarial Diseases.

In marked contrast to the absence of malaria in Barbadoes is the large amount of filarial disease that is present. This is not to be wondered at when one considers the extraordinary abundance of the common domestic mosquito of those parts, *Culex fatigans*, which acts as an efficient host for the spread of the disease. It is an interesting fact that out of more than 600 blood examinations of people from all parts of the island only filaria nocturna was found, filaria demarquaii, which exists in St. Vincent and St. Lucia, and which I lately found in Dominica, never being met with. Although the town of Bridgetown has now a very good water supply brought in pipes from the centre of the island, where it is pumped up from the subterranean collections of water, yet many tanks exist in the gardens of the large houses for watering purposes, and around the native huts barrels and tubs of water are kept and left standing for considerable periods. In those situations myriads of *Culex fatigans* breed and multiply, and may eventually act as propagators of the disease. An examination of the night blood of 600 cases, taken irrespectively of the patients suffering from disease or not, from the General Hospital, Central Almshouse, and from private sources, will show to what extent filariasis prevails in Barbadoes.

Race.	Number Examined.	Non-Infected.	Infected.
Negroes	401 ..	359 ..	44
Mulattos	160 ..	142 ..	18
Whites	39 ..	28 ..	14
Total	600 ..	529 ..	76
= 12.66 per cent.			

The proportion of fourteen infected whites out of thirty-nine is manifestly much too high. Many of those whites, for one reason or another, were collected in the almshouse at the time of examination, others being more or less selected private cases. The table shows, probably correctly, the proportion of the coloured population affected. The figures referring to white people make clear a point on which sufficient emphasis has not been laid before, namely, that the white person is quite susceptible to filarial disease. This is specially so as regards Barbadoes, where persons, whether resident in the island all their lives, or only visiting it temporarily, often contract the disease; the rich and poor are alike in this respect.

In analysing the table, 27, or 4.5 per cent., had definite pathological changes indicative of filarial disease such as elephantiasis, chyluria, filarial lymphangitis, &c., whereas 49, or 8.1 per cent., had no symptoms whatever, the diagnosis being come to by the presence of the embryos in their blood. This latter class is a dangerous one as regards the spread of the disease; for it is manifest that unless sleeping under mosquito nets, which if they are negroes they never do, they nightly infect many mosquitoes, which in turn infect other people and so spread the disease.

To get some idea of the number of infected mosquitoes about, a series of dissections of 100 mosquitoes of the species *Culex fatigans*, taken from the wards and corridors of the General Hospital, in which there were cases with embryos circulating in their blood, was carried out. Of this number 25 per cent. were found to be infected with *filaria nocturna* at various stages of development, and in one mature form were found in the proboscis, thus showing the danger of being near infected people.

The question arises, What can be done for the prevention of filarial disease? Much has now been done and tried for the destruction of *Anopheles*, the malaria-bearing mosquito. Similar or modified methods should be carried out for all domestic mosquitoes. Considering that their breeding places are confined to houses and their vicinity, this should not be a task at all approaching in magnitude to the draining large swamps or to treating them in other ways. Taking Barbadoes as an example, as has already been stated, there is now a perfect water supply, and people can get this fresh from the stand-pipes at their doors. Such being the case, old wells ought to be filled up, no water barrels or tubs should be allowed, or if kept, they should be emptied every week or so. Tanks and collections of water in gardens should all be periodically treated with kerosene, or have closely-fitting covers to prevent mosquitoes getting in. These methods are all simple and inexpensive, and each householder should see that they are applied in his garden and grounds. The difficulty begins when one has to take into account the inability of the negro to grasp anything of a hygienic nature. The only way to get over this would be a system of sanitary inspec-

tion by a few competent men. For individual prophylaxis mosquito nets ought always to be used, but even many educated people still persist in sleeping without them; of course nothing in this line can be expected of the native population.

If such means were adopted for Barbadoes, the prevalence of filarial disease, which is at present quite alarming, could easily, with little trouble and expense, be greatly diminished, thus saving much suffering, as well as loss of time, hideous deformity and, doubtless, in not a few instances, loss of life.

(To be continued.)

Current Literature.

MALTA FEVER.

THIS disease, endemic on the island of Malta, has until recently been supposed to be restricted within very narrow limits, but Captain and Assistant Surgeon Joseph J. Curry, U.S.A., has observed a number of cases in the Philippine Islands, and he agrees with various medical officers of the British army in the conviction that it is a widespread affection in tropical regions. From what he suggests in an article published in the new *Journal of Medical Research*, vol. i., No. 1, it may be that it occurs in our southern States. Since his return from the Philippines Dr. Curry has observed eight cases in the United States Army and Navy Hospital in Hot Springs, Arkansas. Five of them were in men who had returned from the Philippines, one was that of a hospital steward who had become infected in Cuba, one was in a sailor from a man-of-war that had been cruising along the coasts of South America and Central America, and one was in a sailor from a vessel stationed in West Indian waters.

Possibly the vexed question of "typho-malarial" fever may be solved if Dr. Curry's suggestion is carried out. In our southern States, he remarks, there are instances of fever that are neither typically typhoid nor typically malarial, and he thinks it possible that many of them may be examples of Malta fever. He recommends that the sedimentation test with the *Micrococcus melitensis* be added to the list of routine blood examinations, and he thinks that it will be especially valuable and interesting to apply it in cases of persistent recurring rheumatism. In all the cases observed by him in Hot Springs the previous diagnosis had been that of rheumatism, and, indeed, in view of the prominence of the articular symptoms, this is not to be wondered at. The serum reaction in this disease has been found to occur earlier in this disease and to be more decided than the Widal reaction in typhoid fever.

These studies of Dr. Curry's convey once again the lesson that tropical diseases should be investigated more systematically than has hitherto been the case in this country, and that tropical medicine should be taught in our schools. Most of the work, naturally, will in all probability fall upon the medical corps of the army, the navy, and the Marine Hospital Service, but the results of their labours will be of great utility in civil life, particularly in the mercantile marine.—*New York Med. Journal*, September 7th, 1901.

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THE

Journal of Tropical Medicine

NOVEMBER 1, 1901.

OPENING OF THE THIRD WINTER SESSION OF THE LONDON SCHOOL OF TROPICAL MEDICINE.

LORD BRASSEY presided at the opening of the Third Winter Session of the London School of Tropical Medicine, and delivered the inaugural address. Additional interest was lent to the proceedings by the presence at the meeting, and the approaching departure, of the Hon. Sir Francis Lovell, C.M.G., for his journey round the world to collect funds to be devoted to the continuation and expansion of the London School of Tropical Medicine.

Mr. PERCEVAL A. NAIRNE, Chairman of the Committee of Management of the Seaman's Hospital Society, opened the proceedings by announcing the objects of the meeting.

The Right Hon. LORD BRASSEY, K.C.B., in addressing the meeting said: "I have no qualifi-

cation for addressing you on the present occasion excepting this, that I am deeply interested, as all of us in this room are, in the welfare of the Seamen's Hospital Society, an institution of the greatest value. I have been one of its supporters for many years. This meeting has been called for the purpose of opening the third winter session of the London School of Tropical Medicine, and for making known its objects and aims, and to raise further funds to enable it to effectually carry on its work in connection with the treatment of tropical diseases. Now, the salient facts which I have to put before you are these: The London School of Tropical Medicine was established on the initiative of Mr. Chamberlain in the year 1899, when he presided at a banquet, at which a sum of no less than £16,000 was raised for the purpose of giving a suitable equipment to the School, and for the purpose of building wards for the reception of cases of tropical disease. Of this large sum of £16,000, £3,500 was contributed by the Colonial and Foreign Offices, and £1,000 by the India Office, and the balance by merchants and others interested in our Tropical Colonies.

"The London School of Tropical Medicine was originally intended for the instruction of Surgeons in the Colonial and Indian Service, but the work has not been limited to those classes. Private students, missionaries, and doctors in the employ of trading corporations have been allowed to attend and avail themselves of the instruction and advantages which the London School of Tropical Medicine affords. In the first place the School was intended for a limited number—for twelve students only. It was believed that this number would be sufficient. Experience, however, has shown that the demand for instruction is much greater than had been originally anticipated in this particular branch of study, and I may inform you that in the seven Sessions which have been held since the opening of the School, the numbers attending have averaged twenty-five, and during the last Session it was found necessary to refuse several students for want of room; further, some four or five students have been compelled to postpone their attendance until the forthcoming Session in January next.

"In view of these facts it is obviously necessary that, if the work of the School is to be carried on efficiently, further funds should be forthcoming. Those funds would be appropriated to the enlargement of the School, and to the endowment of the chairs of teachers; and they are required in order to place the entire institution on that sound financial basis which is so desirable in the case of an institution which is rendering such essential and valuable public service.

"Gentlemen, I have to ask the public for a large contribution, if the whole of the benevolent design, which we are anxious to carry forward, is to be undertaken with success. I have to ask for a sum of no less than £100,000, and I think I am justified in saying that, large as that sum is, it is yet a small sum for this great Empire, having so large an area within the tropics. It is, after all, not a large sum to ask for in order to improve the hygienic and sanitary surroundings of our fellow subjects in tropical climes. I hope at this meeting we shall make some beginning in raising that substantial sum."

Dr. PATRICK MANSON, F.R.S., C.M.G., said: "I desire to say a few words about the two functions which the London School of Tropical Medicine wishes to fulfil. These are related to each other, yet they are distinct. One is the education of the practitioner who proposes to devote his life to medical practice in the tropics, and the other is the attempt to advance medical science as regards tropical disease. As regards the educational part of the work, I can claim that we have had a distinct success, although we commenced our work with a certain amount of trepidation and anxiety as to the probability of the public countenancing it. Indeed, our work was initiated under considerable difficulty, financially, and considerable difficulty in the way of professional opposition. Both of these, happily, we have succeeded in overcoming—the first, as Lord Brassey has explained, mainly through the assistance and countenance of Mr. Chamberlain, and also through the liberal and enlightened generosity of the Managers of the Seamen's Hospital Society. We want, however, our laboratories very much enlarged—at

least doubled. The accommodation now is simply ridiculous—absolutely inadequate—and must be doubled if the School work is to go on.

"Then, in addition to our laboratory, we want a lecture-room and accommodation for a museum. No teaching institution of this sort can adequately fulfil its functions unless the lectures and demonstrations can be illustrated by specimens. Then, in addition, we want a good library and an increase of the collegiate accommodation. At present we have six rooms in which students live. These six rooms are always filled, and we have always applications for many more. The advantage to the student of living on the premises is very great indeed. It economises his time for one thing, and it gives him an opportunity of studying diseases whose active manifestations occur perhaps at any moment, and even during the night.

"Another important aspect of this collegiate question lies in this, that around the mess table some two dozen, or perhaps three dozen, medical men from all parts of the world congregate; they exchange ideas with each other, and at the end of the session, what at the beginning of the session may have been a new idea confined to one or two men has become familiar to all. Each man picks, so to speak, the brains of all the other men. There is a sort of accumulation of experience, and a man at the end of the session goes away probably with the knowledge and experience of two dozen men. This social life is of enormous value and importance.

"One other aspect of the subject I might speak about. It is extremely desirable that on so important a matter as tropical disease, there should be some sort of centre to which men requiring information on the subject can apply. The London School of Tropical Medicine did not contemplate this at the onset, but gradually it has been forced upon us. Questions referring to tropical disease are being constantly brought to the London School of Tropical Medicine, and not only that, but Mercantile Companies and a variety of institutions whose operations are being conducted in foreign countries apply to us to give them information on the special subjects they are

interested in, and also to supply them with medical men. That is an important development which we did not foresee, and which I readily apprehend will, in the near future, be still more extensively employed.

"At present we have only one resident teacher, Dr. Daniels. He is a splendid teacher, and in addition to extensive knowledge of his subject, and exceptionally large experience, he has personal qualities which endear him to his pupils and his non-resident colleagues. But one man is not enough. Suppose he falls sick—the whole machinery of the school is brought to a standstill. He ought to have at least one assistant to help him, and, if necessary, to take his place when necessary. Such men have to be paid, and well paid. Their whole time is given up to their tutorial and research work, and the remuneration should be in proportion to the importance of their office and the time and energy expended. We should be able to offer such salaries as will ensure our being able to keep a good man when we get him. We lost an excellent man when we lost Dr. Rees, Dr. Daniels' predecessor. We could offer him no career adequate to his deserts. If we lose Dr. Daniels I do not know where we could find a third.

"At the outset of this scheme a great many men came forward, both in medical papers and elsewhere, with the statement that this so-called education in tropical disease was altogether superfluous. They said that the education was supplied by the ordinary medical centres. Now, men who make statements of that sort are either unacquainted with the subject of tropical disease, or have assigned to the ordinary Medical School an amount of knowledge and teaching capacity, in foreign things, which they really cannot and do not possess.

"Another subject about which we feel very acutely in the London School of Tropical Medicine is the difficulty with which we have to contend in our attempts to forward the advancement of tropical medicine as a science. We have done a little—without boasting I might say a good deal—in the recent advance in the study of malaria. The London School has borne no insignificant

part in that. It certainly has contributed its quota to this, one of the most important advances in the science of medicine.

"Some time ago, when Professor Koch was here, I had the opportunity of talking to him on the subject of the expeditions that are being sent out by Germany, England, and other countries, for the investigation of tropical disease. I was rather astonished at the niggardly position that English medical science, in this respect, occupied in comparison with Germany—all the more astonished when I recollected that Germany is a mere child in Colonial enterprise to England, and has an insignificant stake in Colonial work compared with our country. Nevertheless, the Germans spend five times as much money on this subject as we do. I asked Dr. Koch to give me a detailed statement of the expenditure that the German Government was incurring on account of the investigation of tropical diseases, and he very kindly drew it out. This I shall read, and I hope the Press will take particular care to make a note of Dr. Koch's letter.

"In answer to your request, I am sending you a list of the present medical expeditions which are being sent out under the auspices of the German Government, namely: (1) Professor Frosch in Brioni (Istria); (2) Staff-doctor Bludau in Lussinpiccolo (Istria); (3) Staff-doctor Vagedes in German South-West Africa; (4) Staff-doctor Dempwolff in New Guinea; (5) Staff-doctor Ollwig in German East Africa; (6) Dr. Krulle in the Marshall Islands. Further expeditions to Togo and Kameruns are being planned. The expeditions 1 to 5 have for their collective object, in the first place, the investigation of malaria, and form regular continuations of any malaria expeditions made to Italy, Dutch India, and New Guinea. Expedition No. 6 has for its object the investigation of syphilis and its different forms in the South Sea Island groups. The European expeditions 1 and 2 receive 20 marks (£1) daily allowance, besides compensation for the various travelling expenses, outlay for the laboratory, &c. The "outside Europe" (foreign) expeditions receive 40 marks (£2) daily, besides compensation for travelling expenses and outlay for scientific

objects (books, instruments, complete laboratory arrangements, their upkeep, &c.), with a further 1,000 marks (£50) for personal equipment.'

"Now, were England to subsidise the study of tropical medicine to a proportionate extent, instead of two or three ill-paid, almost insignificant expeditions, we would have 100, and each man well paid. As it is, those men who work for the School go out for a mere pittance—hardly a living wage—so small that I would be ashamed to mention the amount. In contrast to this you find the German Government sending out to different parts of Europe men who are paid £1, and to foreign countries men who are paid £2, a day, besides expenses. In contrast to this I dare not mention the insignificant sums we offer men who go abroad for us."

The Hon. SIR FRANCIS LOVELL, C.M.G.: "I think I had better briefly explain the circumstances under which I have agreed to undertake this work on behalf of the London School of Tropical Medicine. It is now over thirty years since I first went abroad. It was in October, 1869, that I travelled the East as far as Alexandria in the P. and O. steamer "Delta," and I had fortunately, as a fellow passenger, his Lordship who has just vacated the chair. That is not the only occasion on which I had the pleasure of meeting Lord Brassey. I have met him and received kindness from him on board his yacht "Sunbeam" and elsewhere abroad. I consider, therefore it is a happy coincidence that I am again about to proceed on another voyage, and a considerably longer voyage than I have taken before, under somewhat similar auspices, namely, the auspices of Lord Brassey, and I trust that the same good fortune which has hitherto attended me in my foreign service, may be extended to me in my present undertaking in connection with the London School of Tropical Medicine.

"On my return from abroad a few months ago, in April last, when I had concluded nearly thirty years' service under the Colonial Office, I went to that Office and stated that I thought the time had arrived when I might retire on what I considered a well-merited pension. With the universal kindness that I have always met with

from all those gentlemen who are connected with the Colonial Office, it was suggested to me that I might perhaps like to undertake some work so as to avoid my finding myself idle, which I did not care for, and it was thought I might perhaps come to some arrangement with the Seamen's Hospital Society, to undertake a mission in order to provide funds to enable that Society to put the London School of Tropical Medicine on a more satisfactory basis than at present exists as regards funds. That proposal brought me into contact with my friend, Dr. Manson, whom it had been my privilege to know for some years past. I paid several visits with him to the London School of Tropical Medicine at the Albert Docks. I saw the admirable work that has been attained there and is being carried on under the able administration of Dr. Manson and his colleagues, and realised how absolutely necessary it is to extend those premises if the aims and objects of the School are to be achieved.

"It was pointed out to me, and I saw the reasonableness of the argument, that in order to enable the School to carry out the objects for which it was instituted, it was absolutely necessary that funds should be forthcoming. The public had contributed very generously on one occasion already, and it was agreed by the Committee of Management of the Society, that an appeal should be made to wealthy residents abroad. I thereupon made an offer to the Seamen's Hospital Society to proceed abroad to endeavour to get the influential and wealthy residents in the East and other tropical parts to contribute towards the object which the London School of Tropical Medicine has in view. That offer was submitted to the Seamen's Hospital Society. I had the pleasure of an interview with the Chairman and Board of Management, and after considering the question in all its bearings they decided to accept my offer.

"It was decided that I should proceed in the first place to India, Burmah and Ceylon, thence on to the Straits Settlements, China and Japan, New Zealand and Australia, probably returning by way of the United States and Canada. I do not think anyone will consider that the sphere of my labours

is a restricted one. However, it is my intention to do the best I can to raise funds to enable the Seamen's Hospital Society to put the London School on such a footing as will render it worthy of its name as a medical teaching body in this great City of London."

A MEDICAL AND SURGICAL EMERGENCY CABINET.

Devised for the Use of Indian and Colonial Surgeons.

By MAJOR H. E. DRAKE-BROCKMAN, F.R.C.S.E., &c.
Indian Medical Service.

A FAIRLY considerable experience of medical work in the tropics has shown me that medical practitioners, either private or servants of Government, are often, owing to their extreme isolation and residence at long distances from any hospital or medical institution whence the necessary instruments, &c., could be borrowed for the time being, greatly handicapped in the efficient performance of their professional work for want of some compact, yet, at the same time, thoroughly well-equipped cabinet containing all the instruments and appliances necessary for medical and surgical diagnosis, as well as those necessary to meet any emergency at a moment's notice.

With the object of placing such within the reach of any medical practitioner so situated, and rendering him independent of his surroundings whatever and wherever these may be, I have, after much deliberation, constructed a cabinet to meet this great want, a brief description of which may not perhaps be here out of place.

The cabinet as constructed consists of two portions, each of the dimensions 26 in. (length) by 18 in. (breadth) by 10½ in. (width), being similar in size and shape, and so made that they can fit into an outer wooden case with handles suitable for travelling if necessary, and can be so constructed, if desired, as to be capable of being slung on to the back of a mule, or other pack animal, in the same way as field medical panniers (military). These cabinets when taken out of their outer travelling cases are handsome little pieces of furniture, provided with lock and key, and which, when placed together, form a suitable and welcome addition to the furniture of the consulting room. The cabinets themselves are made of polished mahogany (can be made of teak if preferred), are supplied with brass handles, and of a size which can be easily moved about and handled by one person like a small trunk. Each cabinet is provided with drawers, all of which are stocked with the necessary instruments and appliances in such a way that they can be got hold of at once, as the latter have been arranged with some system, all being allotted to the several drawers in relation to their use, and arranged together accordingly; for instance, all the instruments relating to uterine diagnosis, &c., will be found in one drawer. The drugs, to which there is a full drawer allotted, are all in tabloid form and consist only of

those which are likely to be required on emergency in the tropics, as well as some of the usual antiseptic solutions in solid form. In this drawer is also to be found a small partition containing the latest pattern of hypodermic sterilisable syringe, together with all the mostly required drugs for injection in tabloid form, and also a few phials of antitoxins, such as antidiphtheritic, antivenene for snake bite, &c., &c. The syringe, it will be noted, I have had graduated to both minims and c.c. in order to be available for use with both tabloids as well as antitoxins.

All the instruments supplied have been chosen after a deal of forethought and with a view to portability compatible with efficiency; for instance, a Kramer's ear speculum has been included, which will answer very well also for the purpose of a nasal speculum, being dilatable to any size, thereby doing away with the necessity for having the two instruments where one will answer both purposes. Certain instruments, such as midwifery forceps, ophthalmoscope, &c., regarding which there is usually a large difference of opinion amongst medical practitioners, can be supplied, according to the individual taste, by the makers; those selected by me are, what I fancy, mostly used by the majority, such as Barnes-Simpson forceps and Jessop's ophthalmoscope, the latter an excellent little instrument, which has the double advantage of being very compact and portable as well as most efficient, a matter of some importance where space is necessarily limited. All the instruments selected are of the metal handle aseptic pattern, in order to facilitate sterilisation.

The greatest care has been taken by me to insure the provision of all the latest and most modern pattern of every available instrument which it has been found necessary to include in the list; still, as above mentioned, these are capable of alteration and modification to suit the individual taste of any practitioner should he have any particular fancy in this respect to satisfy.

The cabinet has been constructed under my direction by the well-known firm of Messrs. BURGOYNE, BURRIDGES AND Co., of London, to whom my thanks are due for the way in which they have carried out all details, and on application to whom all particulars regarding cost, &c., which is very moderate considering its completeness, may be ascertained.

News and Notes.

PRESENTATION TO DR. PATRICK MANSON, C.M.G., F.R.S., LL.D.—The President of the British Medical Association presented Dr. Manson, at Cheltenham, with the Stewart prize, which consisted of an illuminated scroll and a cheque for £50 (250 dollars). This prize is given for the encouragement of the study of epidemic diseases.

MR. FREDERICK PEARSE, F.R.C.S.Eng., M.R.C.P. Lond., D.P.H.Camb., has been appointed Acting Health Officer for Calcutta during the absence on leave of Dr. Nield Cook.

Correspondence.

INSECT BITE.

To the Editor of the JOURNAL OF TROPICAL MEDICINE.

DEAR SIR,—I beg to forward you an insect which I shall be glad if you will kindly get identified. It inflicts a very nasty sting, which is done by a huge proboscis capable of being folded up beneath the maxilla and neck. Acute pain and inflammation follow in a few minutes. In one case the whole leg became swollen.

Yours, &c.,

Singapore.

LIM BOON KENG, M.B., C.M. EDIN.

IDENTIFICATION OF THE INSECT REFERRED TO BY DR. LIM BOON KENG.

To the Editor of THE JOURNAL OF TROPICAL MEDICINE.

DEAR SIR,—The insect you send from Singapore is one of the Hemiptera-heteroptera known as *Conorhinus rubrofasciatus*, De Geer. It is neotropical and oriental in distribution.

Yours, &c.,

FRED. V. THEOBALD.

British Museum (Natural History).

Current Literature.

BERI-BERI.

DR. W. E. SCRIVEN, Assistant Surgeon at the Prison and Pauper and Quarantine Hospitals at Penang, in an interesting letter addressed to the Editor of the *Indian Medical Record* (September 18th, 1901), records the result of the application of blistering fluid to the cardiac region in the treatment of wet beri-beri. Dr. Scriven, who adopted this form of treatment from October 10th to December 31st, 1900, in thirty-two cases, expresses himself as follows:—

"No other medicines were given, not even the much-extolled pineapple, and from notes carefully kept, it was observed that the swelling disappeared on an average of nine days. Amongst these, seven ended fatally from diarrhœa, leaving eleven remaining with no œdema whatever, but only with the usual symptoms as seen in the dry form of this disease; the others were discharged as cured. It may be added that in several instances the blister had to be repeated as often as four times, and where the fluid failed to take from the tough state of the skin."

The following table gives the results of the treatment:—

Total treated	Discharged	Average stay of those discharged	Died	Average stay of those who died	Remaining	Average stay of those remaining	Remarks
32	14	36 days	7	50 days	11	49 days	—

BERI-BERI AND WHITE LEPROSY.

By ALBERT S. ASHMEAD, M.D., New York.

Dr. F. W. Cox, of Vermilion, South Dakota, in his article, "The Subject of Tropical Disease," November number of the *Medical Herald*, speaks of Philippian

beri-beri as being "an endemic disease, and, undoubtedly due to infectious micro-organism." That is a question of opinion. Neither Dr. Takaki nor the Dutch East Indian doctors believe this. It is endemic, if you choose to call it so, only in the rainy season, and a thousand beri-beri specialists believe that it is *not* due to a micro-organism.

I, myself, believe that it is due to poisoning by carbonic acid gases, in crowded quarters of prisons, &c., from (Japanese) charcoal stoves, and the general lack of ventilation in the rainy season. As soon as the north-west monsoon begins to blow (beri-beri is prevalent only when the southern monsoons are blowing), beri-beri disappears. Absolutely, in Japan, there is not one case again until the next rainy season. That a micro-organism has nothing to do with the disease is proved by a case reported by Miura, of Japan, occurring on the top of Fujiyama, 12,600 feet above sea-level, in the month of December, that of a scientist, who was closely shut up in a cabin, moored to rocks, to keep it from blowing away, and with all crevices in its walls calked up to prevent his freezing to death: his sole dependence for heat being his little Japanese charcoal stove. As it was, his fingers were badly frozen, and he contracted beri-beri. Now, if a germ could foster itself at that altitude, in north wind blowing, cold December (patients sent to the slightest altitude in the rainy season quickly recover), why should it not develop at sea-level in the same month in Japan? It never does. Dr. Cox's statement that the paralysis present in beri-beri is accounted for by the alterations found in the spinal cord, as well as pressure by "effusion on its surface" is disputed by most beri-beri pathologists, who claim that it is due to peripheral neurites, most prominently the pneumo-gastrics and tibials. Their conclusion that it is not of central origin is corroborated by the frequent occurrence of circumscribed œdemas along the special vaso-motor nerves. Moreover, beri-beri was not epidemic, that is, did not occur in many people, in the rainy season, at one time in Japan, until the use of charcoal as a fuel became popular, that is, in 1590. In 1740, two Japanese doctors, Kagawa and Noro Gendji described it as a new disease, yet it had been in China for centuries before this time.

One word more, as to leprosy, and what Dr. Cox says of the disappearance of pigments in anæsthetic lepers, "so that the skin becomes perfectly white." Here we have what is just showing itself, in the descendants of Scandinavian lepers, in our American North-west, an abortive type of leprosy. One finds this also in Japan, in Brazil, &c. The important question is whether the disease can, after reaching this stage of radical disappearance, regenerate itself. I believe that it can. Even the "white leper" of France, Zamboco Pacha thinks, is capable, under renewed conditions, of once more inoculating Europe. —From the *Medical Herald*, February, 1901.

DIARRHŒA.

A NEW METHOD OF MAKING TANNIN AVAILABLE AS AN INTESTINAL ASTRINGENT.—Albert C. Barnes and H. Hille have found that by the synthesis of nucleinic acid and albumin there results an entirely new body,

which chemical analysis shows belongs to the nucleo-proteid class of bodies. Under certain conditions this body enters into chemical combination with tannin and forms a yellowish-brown tasteless powder containing 50 per cent. of tannic acid. This substance is insoluble, does not precipitate albumin, pepsin, or peptones. Experiment has proved that 75 per cent. of the tannin nucleo-proteid passes through the pylorus chemically unchanged, and it must be, therefore, practically free from astringent action upon the stomach. It has also been shown that this tannin nucleo-proteid but very gradually evolves tannin from its combination. Thus, as the remedy passes downward through the intestines, the astringent is brought into contact with the entire intestinal canal. The astringent action of tannin is more complete when but small quantities come in contact with any one part of the intestinal mucous membrane, while larger quantities produce local irritation. This new remedy should be successful in the treatment of diarrhœa and of various diseases of the intestines associated with diarrhœa.—*Philadelphia Medical Journal*, July 20th, 1901.

DYSENTERY.

R	Magnesii sulphatis..	..	..	5i.
	Acidi sulphur. dil. ..	..	..
	Tinc. opii. ..	..	..	āā m̄x.
	Quininae sulphatis ..	..	..	gr. i.
	Hydrarg. perchl. ..	..	..	gr. $\frac{1}{32}$
	Aquæ menth. pip. ..	..	..	gr. $\frac{1}{5}$ ss.
M	Sig.: This dose q. 3 h.			

PLAGUE.

PLAGUE appeared in Liverpool in the Everton district during the last week of September, 1901. Up to October 31st six persons died of the disease. Plague re-appeared in Glasgow on October 29th, 1901, three cases being reported up to October 31st.

WAR ON RATS IN JAPAN.—The health authorities in Tokio, in their efforts to suppress the plague, have offered a bounty for the killing of rats in the infected district, with the result that over 200,000 of the rodents were destroyed in the course of two weeks in June. As an additional measure, infected buildings covering nearly half an acre were burned.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Mèdec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Caducée.
Climate.
Clinical Journal.

Clinical Review.
Giornale Medico del R. Esercito.
Hong Kong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Medical Review.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
Public Health.
Revista de Medicina Tropical.
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Sei-i-Kwai Medical Journal.
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2.—Manuscripts sent in cannot be returned.

3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

5.—Authors desiring reprints of their communications to the JOURNAL OF TROPICAL MEDICINE should communicate with the Editors.

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The Malarial Mosquito in Hongkong.

FROM THE

“CHINA OVERLAND TRADE REPORT.”

The accompanying notes concerning the existence of the Malarial mosquito in Hongkong were read by Mr. C. V. Ladds at a meeting of the South China Branch of the British Medical Association on Monday evening:—

In a Circular Despatch from the Right Honourable the Secretary of State for the Colonies, dated December 6th, 1898, His Excellency the Governor was requested to forward to the Colonial Office a collection of mosquitoes from the colony with a view to investigating the possible connection of Malaria with this genus of insect.

Two collections were forwarded as requested upon August 18th and November 24th respectively, and none of the species *Anopheles* having been included in these collections it was thought at that time that they did not exist in Hongkong. Having always taken a great interest in the Malaria question, and not being satisfied with the result obtained during the above investigation, I determined to take up the subject privately, and commenced work in December, 1899.

After going thoroughly into the matter, and after having cultivated the larvæ of many varieties of mosquito, I at length found that the *Anopheles* undoubtedly did exist in the colony and was to be found in most of its known malarial districts. I first discovered them close by a Government bungalow at Kennedy Town. The different occupants of this house having been subject to repeated attacks of fever ever since its erection in 1895, I determined to make this place my starting point, and after a very careful examination, I found a small pool swarming with *Anopheles* larvæ within fifty yards of the building.

Extending my search I found the same species near the Kennedy Town Fever Hospital, at Magazine Gap, at Wong-nei-cheong village, near a house on Bonham Road, at Quarry Bay, close by the Taikoo Sugar Refinery, all round the camp of the Welsh Fusilier detachment at Kowloon, and in many other places.

This being sufficient evidence of their existence over a considerable area of the colony, and having now no doubt that they were to be found in all the malarial districts, I next proceeded to examine the particular kind of pool which the *Anopheles* appeared to select as most suitable for the propagation of its species.

A small shallow pool containing algæ, or green flocculent water-weed, and fungoid growths, abounding in all kinds of aquatic insect life, and which is not quite stagnant (or if stagnant at the time of discovery is not likely long to remain so, but is renewed occasionally by small flushes of rain water), appears to be their favourite *habitat*.

In nearly every instance I found them only in such pools, which were in most cases fed by minute streams issuing from small springs in the hill side, and these not being of sufficient volume to scour out a channel of their own, just spread themselves over the surrounding lower ground, and so help to form and feed the typical *Anopheles* pool.

They do not seem to inhabit pools which are entirely stagnant (or likely to remain so long) or which contain no water-weed; and appear to be particularly careful in their selection, as, although there may be dozens of pools in the locality, only a few of them may contain *Anopheles*.

Having repeatedly found the mosquito hovering round a pool which contained the same species of larvæ, it is probable that the adult insect returns to its original home to deposit its eggs, and this theory may, if correct, account in a measure for their not being found scattered indiscriminately about everywhere. After once seeing the particular kind of pool which these mosquitoes affect it is easily recognised, but it is not quite so easy to describe it correctly; yet I trust that I have given a fair general idea of what to look for.

I find by experimenting that the *Anopheles* larvæ appear to feed upon the algæ or water-weed which is found in their particular pools, and also possibly upon some of the animalculæ which they contain. This I proved by placing some larvæ in clear tap water and others in water taken from an *Anopheles* pool which contained water-weed; those in the former dying quickly, while those in the latter hatched out in due course. I should not say that the larval stage of the insect is a long one, probably about a week to ten days, this depending a good deal upon the nature of the pool; after which time they emerge therefrom as adult mosquitoes. The life of the mosquito itself probably extends over a period of several weeks, perhaps longer.

I have so far not succeeded in finding the *Anopheles* larvæ in any of the healthy districts of the colony, or far distant from human habitations, nor have I yet found them in rice fields, in large pools of water, in rapidly running streams, in pools with sandy bottoms, in wells, old broken pottery, tubs, pans, &c., as in the case of *Culex*, which may be found in almost anything which contains water.

In contradistinction to the *Anopheles*, water-weed does not seem to be necessary to the existence of the *Culex* larvæ, they being often found in pools, &c., from which it is entirely absent. A further distinction between the two species being that the former appears to be much more delicate than the latter. It is not necessary here to describe the *Anopheles* larva or mosquito, they being so entirely different from the other species as to be easily recognised after having been once seen. Having satisfied myself as to the existence of the *Anopheles* in the colony, and having given a brief description of its *habitat*, &c., I will now pass on to the possibilities of its extirpation from the island. With this object in view, I have been testing the effects of various insecticides. I found that kerosene used as described by the African Commission was very effective in still pools, or in those which were temporarily stagnant; gas tar also proved to be very useful, but in my opinion **Jeyes' Fluid** is the best of those which I have tried up to the present.

So far as my experiments have gone, I find that one part of **Jeyes' Fluid** to 10,000 of water kills both *Anopheles* and *Culex* larvæ in a few hours, very much weaker solutions destroying them after a longer interval.

Permanganate of potash appears to be of very little use. In a solution of 1 to 1,200 of water, equal to one in five of Cond's Fluid, the larvæ lived for twenty-four hours, and were as lively as ever at the end of that time, while in a solution of 1 to 500, equal to nearly one in two of Cond's Fluid, they lived for four hours without there being any appreciable effect upon them, and even after twenty-four hours more than half of them were alive.

Hence by treating all *Anopheles* resorts frequently with **Jeyes' Fluid**, kerosene, or gas tar, during the whole of the dry season, when such pools are comparatively scarce, and by paying particular attention to surface drainage in malarial districts, much might be done towards effecting their partial, if not total, extermination.

In conclusion, I think I may safely say that by working upon these lines, and given the services of half-a-dozen intelligent coolies, some one to look after them, and the necessary supplies of the above-mentioned chemicals, in a very short time it would be possible to cause the *Anopheles* to become so scarce in Hongkong that should they prove to be the *only* source of infection by malaria, cases of malarial fever would soon be as rare as cholera, and the finding of the *Anopheles* larvæ in any part of the island as difficult a matter as looking for the proverbial needle in a truss of hay.

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Original Communications.

ON SOME UNDESCRIBED HÆMATOZOA OF
MALARIA IN THE MALAY PENINSULA,
AND ON BLOOD-PLATES AS HÆMATO-
BLASTS.

The First Part of this article, with plate, will be found in the JOURNAL OF TROPICAL MEDICINE, Sept. 16th, 1901.

By W. LEONARD BRADDON, F.R.C.S.
State Surgeon, Negri Sembilan.

PART II.—ON BLOOD PLATES AS HÆMATOBLASTS.

THE changes which accompany formation of the red discs from their earliest antecedents to their most mature forms, so far as they are to be observed in the circulating blood, are, as might be expected, exhibited in a greater degree than ordinary when disease or accident entails in that fluid more rapid processes of regeneration or repair. It may well be supposed that in malaria, pre-eminently a disease of the blood itself, in the course of which the erythrocytes are destroyed in enormous numbers, the process through which regeneration is effected should be more abundantly manifest. Accordingly, the study of the blood, especially in living films stained with the fluid which I have described, is rewarded by surprising revelations. It is to some of these, readily to be seen in almost every case, in the blood at least of recovering malarials, that I shall draw attention in this paper. As the observations deal with the blood-plates and their relations to the other formed elements, it may be as well to give a *résumé*, first, of the little that is known about them.

Hayem¹ then, who claims to have been the first to have accurately described them (and who, in particular, used the method of spreading out the blood in capillary films for observation) says of the blood-plates, as observed in fresh blood, that "they are very minute

corpuscles resembling at first little red globules of extreme delicacy and paleness. Hardly have they been perceived than they have already altered; they become thorny, stick to the glass, wrinkle, and grow paler, while some of their substance disappears; they have a tendency to cohere with corpuscles which they encounter so as to form a heap. . . . or they remain discrete, or form strings or bunches. . . . Almost immediately they become profoundly changed and nearly unrecognisable.”² Studied under conditions designed to fix them, Hayem described the plates as being distributed throughout the film separately or in small groups rarely exceeding five plates in number. “They are remarkably sharp, very delicate and pale. Some are slightly discoid, others (a good many) are sub-globular, round or elongated, having a sort of stalk of different lengths, or borders which are indented” (p. 86).

Seen thus intact, without any re-agent, the hæmatoblasts—Hayem so designating the blood-plates—"are perfectly homogeneous and smooth of surface, their appearance is colloid, or slightly glassy; and sometimes they are sensibly tinted yellowish or green. The smallest, which are colourless, are without granulations, bearing no resemblance to any part of white cells. . . . their diameter is about 3μ" (*loc. cit.*).

"The exact shape of the element is difficult to determine. In fresh or circulating blood the hæmatoblasts are flattened or sub-globular; in preparations made with fixing fluids, especially with osmic acid, they seem to be bi-concave, like the red corpuscles. However, when examined dry they refract light as do convex bodies. This peculiarity alone will be enough to enable the smallest red corpuscles to be distinguished from 'hæmatoblasts.'"

He goes on to prove by the manner of reflection of images from their surface that the platelets are

¹ *Du Sang*, p. 82, et seq.

² *Loc. cit.*, p. 85.

³ *Loc. cit.*, p. 93.

certainly convex in surfaces (a property as to which in our staining fluid any observer may readily satisfy himself). The same properties are exhibited by the very small red corpuscles of the goat, however, Hayem points out, and says that such optical properties *under the conditions* are no proof that the plates are really globular, as opposed to the hollowed out red corpuscles. In the fresh blood, even when examined in a film carefully sealed from the air, the plates change more rapidly than any other element. They proceed to dissolution after the blood has been drawn but a very short time. Examined a little later Hayem notes that the plates are "irregular, angular, and that in this condition they present two portions, more or less sharply distinguished, a peripheral finely granular, another central, corpuscular, of vitreous appearance, and considerable refractility. Their first alteration is shown, then, in a kind of retraction which makes them more shining and brighter, and by the exudation around them of a special matter."

"The substance which thus comes so rapidly out of the 'hæmatoblasts' is extremely viscid, and this property well explains the formation of the little heaps. At the very beginning the 'hæmatoblasts' join together in the form of little angular grains or small stars composing often a sort of chaplet, every grain of which is distinct; then the small plates appear to be drawn together strongly, the sticky substance which surrounds them going to form a common mass, in which its constituent elements are overlaid and confounded."

From such an agglomeration, as from discrete plates wherever scattered throughout the plasma, run out the fibrinous threads which are precursors of coagulation.

Hayem was unable to demonstrate any formed structure in the plates. In the largest ones, met with in anæmias, he recognised a certain "coarse granulation, with a bright centre, somewhat eccentric but close to the middle. This granulation is sometimes to be seen also in the smallest and most delicate plates, and is exactly analogous to what we have noted in the red corpuscles. As it has the appearance of a nucleolus the indication was to determine the presence of nucleus in the plates. But by variously staining these elements, fixed in different ways one may be convinced that they contain no nucleus analogous to that of the nucleated red discs. In this respect again they resemble the non-nucleated red corpuscles."

Hayem goes on to demonstrate the occurrence in the blood of forms intermediate between the platelets and the mature red corpuscles. He finds them chiefly in what he calls dwarf forms (*globules nains*) which possess physical properties intermediate between the two. Under this name he includes all the small coloured discs under 6μ .

Between them and the plates on the one hand, and the largest giant forms on the other, every size is, in different conditions of the blood, to be met with.

Hayem, therefore, concludes that the plate is an "element in evolution. . . . At first minute,

delicate, colourless, extremely vulnerable, it grows, acquires traces of hæmoglobin, becomes more refractile, and more resistant to the process of coagulation; then arrives a time at which its chemical constitution is altered more completely still, and at which its hæmoglobin colouring is equal or nearly so to that of the red disc. Becoming a 'dwarf' disc it then loses the physiological properties which characterised it, to acquire those of the red corpuscles."

An extending study of corresponding forms in animals having nucleated red discs, confirmed Hayem in these views of the rôle of the blood-flakes in human blood. In such animals the flakes, like the mature discs, are also nucleated, and between them and the adult forms every stage is normally to be met with.

Upon such grounds Hayem felt justified in appropriating for the plates the designation of *hæmatoblast*.

To the observations made by Hayem nothing of importance, so far as I can discover, has since been added. Ehrlich³ finds that, like the plasma, and the protoplasm of the white corpuscles, they are strongly *alkaline*, as shown by the iodine-eosine method—in this respect differing from the red corpuscles. According to the same author they also contain *glycogen*. "The blood platelets," Ehrlich and Lazarus say, on the grounds of their small size and complete lack of nuclear substance, are generally regarded as not analogous to real cells. Whether they represent intravital precipitation of substance, as of the plasma, or whether they are budded off from the cells, cannot at the present be decided with certainty, though many facts seem to support the latter assumption. That they contain glycogen marks them as descendants of the blood cells. Moreover, appearances are often met with in dry preparations that arouse suspicion that the platelets arise from the red blood corpuscles (Koeppel). Arnold has further observed processes of budding in the red blood corpuscles not only extravascularly but intravascularly, in the mesentery of young guinea pigs, and has seen the elements that were cut off change into forms free from hæmoglobin.⁴ Cabot⁵ says of the blood-plates, "unless their number is increased by some pathological influence, we seldom notice them at all in normal blood. . . . The blood-plates are irregularly shaped, very cohesive elements, about one half the diameter of a blood disc, usually seen clinging together in masses like zoogloea. They are colourless and not amœboid and look like *débris*." He estimates their frequency normally as 400,000 to 700,000. He says that they are stained easily with eosin, and they are usually considerably increased in processes of blood regeneration.

Foster's⁶ summary adds nothing new, but emphasises the origin of the red corpuscles from nucleated precursors, formed chiefly in the bone marrow.

These bodies, the average sized among which are termed normoblasts, being of about the same dimensions as the average red corpuscle, arising chiefly in the bone marrow, are formed there by the division of similar cells.

³ "Histology of the Blood," p. 46.

⁴ *Loc. cit.*, p. 192.

⁵ "Clinical Examination of the Blood," p. 53.

⁶ "Physiology," p. 48.

¹ *Loc. cit.*, pp. 94, 95.

² *Loc. cit.*, p. 99.

In the normal blood their occurrence is rare, but they are a constant constituent of it in leukaemia; and after severe hæmorrhages and other conditions stimulating regeneration, may appear in it in overwhelming numbers. Smaller nucleated forms (microblasts) and extremely large ones (megaloblasts) are also found in the blood, but only in diseased conditions. The nucleus of these erythroblasts disappearing, whether by absorption, or extrusion, all the cell-body which remains functions as an ordinary red corpuscle. By this process and by it only, Ehrlich and others claim, are the red corpuscles of the blood ordinarily brought into being.

Milroy, in an article on the physiology of blood,¹ states that the plates are shown by their staining and other properties to be "nuclear or nucleoid," and that they are believed to arise from the nuclei of the leucocytes.

I do not propose here to examine *in extenso* these opposing theories, but such a sketch of them was necessary for a proper appreciation of the observations which I am about to detail. And first one or two *a priori* considerations may be submitted as emphasising that aspect of the matter to which I believe the conclusions which I shall have to offer afford support.

One of them is the enormous number of the red corpuscles themselves which have to be supplied, from whatever source they arrive. In the normal process of their decay, even, it seems probable, and there is evidence in the excretions to support the view, that *myriads*—a myriad is 10,000—may require to be replenished daily. Through trauma, or disease, destruction of hundreds of millions of these bodies occur, and is made good by others formed within a space measured by only a few days. It seems incredible that in the limited bulk of the marrow of all the bones together sufficient regenerative cells can exist to bring about this replenishment.

Again, as Ehrlich and Lazarus point out,² "it must always be borne in mind that, in normal blood, the individual red blood corpuscles are by no means of the same value. Step by step some of the cells are used up and replaced by new. Every drop of blood contains, side by side, the most various stages of life of fully formed erythrocytes." This being so, it might surely be expected that the normoblast should be as frequently in evidence as any of the other forms.

It has not been shown, nor is it likely to be claimed that, in health, the more or less permanent marrow-cells, by the division of which erythroblasts are formed, exhibit—being, as it may be supposed, mature—such extraordinary differences in size as actually do the red corpuscles. There should, therefore, be an average stage in the evolution from unhæmoglobinised nucleated cell to fully hæmoglobinised denuded disc, which should be met with more frequently than other stages. In other words, the free circulating form should (as having been produced by normal and average processes) enter the blood from its station of origin always of a common size, which would naturally be the smallest therein met with. But discs of

the smallest size—necessarily as frequent as those of any other particular dimension (except the fully developed) as they must be, if all the cells are growing equally—exceed by far the average numbers of the normoblasts which indeed are, except in infancy and diseased conditions, found rarely in the blood. And although the youngest forms of the blood discs, they are already no longer nucleated when they enter the stream. It is very surprising, therefore, to find that when normoblasts are in evidence in the circulation, their size (as accorded to them by nearly all observers) is that of an ordinary fully formed red corpuscle. It is conceded on all hands that the microblast is evidence merely of disease; in any case its extreme rarity precludes any assumption that it may be the usual precursor of the disc.

Except in foetal blood nucleated discs of any kind, indeed, are so uncommon, that it is hard to credit the theory that everyone of the billions of red corpuscles has each at one time been such a cell.

Again, if as may be supposed in health, the output of discs is fairly regular, and their natural liability to decay equally so at every stage, it is manifest that the *youngest forms in the series must predominate* in number over all the others, except the fully grown discs, the proportion of which latter will depend on the average duration of their life after, as compared with the period before, attaining maturity. Now unless it be the blood-plates, there are to be observed in the blood discs of no other stage of growth sufficiently numerous nearly to satisfy this condition. On the other hand *there are* the blood-plates, consequently present in numbers, which normally (400,000 to 700,000) would appear to be sufficient to supply all normal losses and regenerative demands, and for the presence of which no other function has ever been even suggested, and between which and the mature corpuscles Hayem first noted and others may demonstrate every grade of evolution.

I regret that want of extended leisure has prevented my own work from being more ordered and systematic.

The facts which I shall detail have been drawn, however, from numerous and careful, and often prolonged observations of the blood of individuals of every age and condition, and are easy to be repeated by any observer. The conclusions to be drawn from them support and even extend the theory of Hayem.

As to *technique*, my observations have generally been made upon blood drawn in a capillary film between cover-slip and slide, sealed by vaseline from the air. Dilution, when practised, was effected with a 1 or 2 per cent. solution of potass. cit., or a similar solution with $\frac{1}{2}$ to 2 per cent. of methylene blue added. The first observation to be made then is that *whenever examined* the blood of all individuals contains larger numbers of red discs *below* than of those which have attained to a size of 7.5μ which may be taken as the mature standard. Especially in solutions diluted with the stronger methylene blue stain, the presence of discs of every dimension is to be observed (as Ehrlich admits), and of every degree of hæmoglobinisation. Hæmoglobin is driven out from the corpuscles by the solution, and the more readily the younger and smaller the discs, or the less strongly coloured they appear to be. The *form of the*

¹ *Encyclopædia Medica* (edited by Watson). Edinburgh: W. Green & Sons, 1899.

² *Loc. cit.*, p. 49.

stroma is, however, perfectly preserved, corpuscles so treated retaining a clear and perfect contour, usually for two or three days; some of them often for five or six.

This renders obvious, what previous methods have failed so well to show, that the relative number of smaller discs greatly preponderates; and (as it seems to me) this preponderance inversely with size increases all the way down to the smallest formed elements, namely, the blood-plates. As compared with any other particular size which can be measured in a field, the plates (containing together all those under say $2\frac{1}{2} \mu$) are always and by far the more numerous. In conditions of blood-regeneration, as after malarial attacks, this excess of the smaller over the larger elements is very striking. *In specimens from such cases the plates are so numerous as greatly to exceed all the other forms together.*

It is to be observed that their extreme delicacy (thinness) and pallor (lack of hæmoglobin) render it almost impossible to detect many of the younger discs in ordinary fresh blood, and that nearly all the fixing and staining processes result in destroying them. In blood spread out in thin films and dried rapidly, the contour of young discs, like that of the blood-plates, becomes wrinkled, and the shapeless masses which represent them are often indistinguishable from aggregations of the latter, and from the lumps and masses of "protoplasm" which observers conveniently label as *débris*.

(2) Regarding the *appearance of the plates as seen in fresh blood*, there is nothing to add to the observation of Hayem.

The addition of my solution reveals more striking pictures.

Blood-plates as then seen in the blood, undisturbed except by dilution with a staining fluid which does not destroy them and into which the blood immediately flows from the finger, occur either discretely or in groups of few or many—I have counted fifty in such a group. They rapidly absorb some of the blue and appear as delicate clearly separate bodies of a finely granular (blue) substance (cyano-plasm), upon or in a still more delicately transparent and more brightly refractile matter. Within ten minutes afterwards the stain is deeper, and the separation between the two substances perfectly distinct. The cyano-plasm—chromatin, perhaps true karyo-plasm—is more or less spherical in shape and exhibits deeper central (nucleolar ?) staining; the other matter appears as a clear, unstained, sharply-contoured refractile disc. There then takes place a gradual separation between the colourless disc and the small mass of spherical cyano-plasm. The actual movement in process is not sensible to the eye, but in the result the separation may proceed until a slender connection only exists between the two bodies (*see* Plate III., fig. 14). At first coloured, this connecting thread later becomes colourless. Finally, complete separation occurs, no doubt between all such bodies, but I have actually observed it only in some of the larger forms.

The still associated discs and spheres are bodies of singular beauty and clearness.

The connecting thread of cyano-plasm, usually straight, may be curved, but in any case appears to

have some degree of rigidity, for the coupled bodies may be observed when drawn or driven to and fro by currents between groups of corpuscles, to retain perfectly and without bending, their shape and relative positions. The adhesiveness of blood-plates to foreign matter has been abundantly noted. The addition of the pot. cit. and m.b. solution seems to diminish this property of theirs. It may be observed that the statement so commonly made that the plates "run together" when the blood is shed, owing to this quality of adhesiveness, involves some misconception. The true interpretation of such groups, I shall suggest later, is quite different, and involves a very important argument relating to their origin. I find, in fact, that the distribution of the plates more discretely or in clusters depends but little on mode of manipulation. Let several specimens be taken from different individuals, or from the same person at different times, and subjected to the same procedure, and it will be found that nevertheless the groupings of the plates are totally different.

The stickiness which is assigned as the cause of aggregation of the plates is, in fact, an argument against it, when, for instance, the blood is drawn, in a natural manner, by capillary attraction into the smooth space between two glasses; since, not being possessed of that independent mobility by which alone they should be enabled, as it is phrased, "to run together," they more likely and actually do adhere to the first foreign surface with which they are brought into contact.

It is at least as probable *a priori* that such groups are the original formation, and that discrete plates occur through their scattering, and this I hold to be a proper interpretation of their distribution. So far, then, *the characters of the plates* as revealed by the solution are those of exceedingly minute formed cells, and the interesting process which has been described resembles that of "nuclear extrusion," claimed by some as the normal fate of the nucleus in normoblasts; although Cabot holds this—the original view of Ehrlich—to have been disproved. Under artificial conditions the occurrence of such extrusions is undoubted. The happening of a similar process therefore in the blood-plates supports the contention that the extruded matter, which I have referred to only as cyano-plasm, is really nuclear in nature too.

(3) Beside the blood-plates there are to be observed in all bloods (but again most abundantly in the post febrile regeneration of malarials) forms which present a complete and unbroken series between them and fully formed discs (Plate III., figs. 5 and 6). In all particulars these bodies otherwise resemble the plates. The same separation between spherical cyano-plasm and discoid stroma occurs with them. When the "plate portions" of the larger among them have become detached they are to be distinguished from a mature disc in nothing except their tenuity and lack of hæmoglobin.

As regards these particulars, and that of size, the remarks already made show that a complete series of gradations in forms acknowledged as red corpuscles, also occurs. The contention of Hayem, that in the blood takes place, and in it exist examples of

every stage in the evolution of the red disc from the platelet, the true "hæmatoblast," is therefore amply supported by observations which he who wills may confirm. But so complete and clear a demonstration of the process in the "hæmatoblasts" themselves was not obtained by Hayem for want of a suitable medium.

(4) A yet more remarkable, and I believe previously wholly undescribed phenomenon is to be observed in similar preparations of blood, under certain conditions, which I have met with so far only in cases of regeneration in malarials after the paroxysm. It is the *formation from leucocytes of flattened discoid processes or plates which ultimately become separated, forming bodies indistinguishable from red discs*, in anything except their size and the absence of hæmoglobin. Ehrlich, it is true, mentions a formation of free "plasma elements" by budding, especially from large lymphocytes. But these "buds" would appear to be spherical forms. The plate processes now described (Plate III., figs. 9 to 20) appear to be differentiated from the cyano-plasm of either lymphocytes, or (and chiefly) from the neutrophil polymorphonuclear leucocytes, the nucleus and nucleolus remaining sharply distinguished and taking no part in the proceeding.

The plates vary in size from 3μ or 4μ up to 10μ , 15μ , or even 20μ , but the average dimension is nearer to that of the ordinary red corpuscles. There appears in many leucocytes a tendency to the formation of as many plates as the nucleus itself, often fully divided, shows divisions. Where a single plate is formed from a single mass of cyano-plasm, which becomes in the process separated from it, the whole proceeding again exactly resembles "nuclear extrusion"; but in many cases the volume of nucleus (cyano-plasm) extruded greatly exceeds the clear (supposed) cell body remaining (cf. forms figs. 13 and 14). In other instances, several plates become separated out from a single smaller mass of cyano-plasm which itself remains undivided (Fig. 16).

In their optical characters these plates resemble the minute blood-plates; appearing as smooth homogeneous refractile discs of perfectly flat surface and perfect circular, seldom ovoid contour. Detached in the plasma they are not distinguishable from the discs of the hæmatoblastic series already described.

The process of formation is slow, the actual motion of separation not being perceived by the eye. Fully formed and separate processes are met with only after the blood has been under observation for some hours. The process appears to continue until necrobiotic changes supervene in the fluid. It is to be remarked that the movements of malarial parasites, the streaming of their pigment, the movements of amœboid leucocytes, and the vivacious agitation of the granules in eosinophil forms, continue unabated in these preparations for many hours, and continue often long after the process of plate differentiation has begun, facts which must greatly weaken any argument which may be raised that the process described is wholly or in part either factitious or necrobiotic.

But those are points for which I am not now concerned. At present I claim only, that these observations show, that under certain conditions of stimulus or environment, free structureless discs, closely re-

sembling in their shape the red corpuscles, are formed from the protoplasm of leucocytes. Such a function suggests a hitherto entirely unsuspected relationship between the white and the red corpuscles.

(5) Ehrlich claims, and so far as the demonstration of a continuous series of gradations between the one and the other can establish it, seems to have proved a relationship of evolution between the large monuclear lymphocytes and the p.m.n. leucocytes.

It is not hard to imagine that all the white cells, if not genetically related, should have certain functions in common. I have mentioned that my "plate processes" are formed from both p.m.n. cells and lymphocytes.

The constant tendency to division of the nucleus which characterises this group of leucocytes has not yet been explained, actual division of the whole cell in the blood having seldom been observed. Nevertheless it must be supposed that the division of the nucleus, as it certainly is purposive, is probably also progressive.

In examples of blood in which most of the white cells seen are amœboid, as frequently happens before the onset of a malarial paroxysm, gradations occur between p.m.n. forms, having many well defined, clearly stained nuclei, and others in which the karyoplasm appears to be almost uniformly diffused through the whole of the protoplasm, and to be evidenced only by the deeper staining of parts of the latter. Other masses of cyano-plasm yet occur (under conditions to which I cannot give precise definition) which, while resembling the more diffuse of the last forms described, yet appear hardly to present characteristics by which they could be classed as single cells. Between these again and a closely packed aggregation or heap of blood-plates, there is no distinction which is obvious, either optical, or in reaction to stains, save only that in some such cases the mass is resolved into separate elements (blood-plates), but in others it is not. Here then is suggested a mode of origin of the blood-plates which, if entirely novel, has at least some plausibility.

In this view the evolution of the large lymphocytes with one nucleus into the p.m.n. cell with many nuclei: the further sub-division or diffusion of the latter in numerous small points throughout the protoplasm, the breaking up of such a mass into the largest possible number of smallest karyoplasmic centres, at or from which the smallest formed elements of the blood, the plates arise; the occurrence of such plates in groups and masses, which are only evidence of their community of origin; the subsequent separation of the plane disc or plate of stroma, from its cyano-plasm (if not the gradual absorption of the latter within the former); the isolation of such disc-bodies, their growth, and the elaboration by them of hæmoglobin from the plasma, and their final maturation into red blood corpuscles—from a conception of the relationship of the principal elements of the blood, which is at least complete and harmonious.

One of the phenomena which Hayem found difficult to interpret, was the fact that while examined in *fluid* the blood-plate, so soon as its clearer and more refractile portion became distinguishable, appeared to be bi-concave, and was surrounded by a sort of halo

of unformed granular matter, but when examined in a rapidly dried film the same bodies appeared to be actually larger in size and bi-convex. It seems evident that in one case, the cyano-plasm is caused to be extruded in a formless condition by the injurious action of the medium, while the cell-body—as I may now call it—becomes flattened, more refractile, and of smaller size. On the other hand, the whole body, when rapidly dried, nearly retains its proper bulk, and some degree of convexity due to the presence within it of the not yet extruded cyano-plasm.

Finally, as opposing the theory of blood genesis held by Ehrlich and his followers and supporting that of Hayem, which they have, it seems to me, somewhat contemptuously endeavoured to dismiss, reference may be made to one or two further considerations.

The myelogenous theory of blood formation is that every blood cell has arisen within the bone-marrow and from a nucleated precursor. The presence of such forms in the blood occurs only when and is a sign that the hæmaphotysis is in excess of the normal. It were to be expected, therefore, that when normoblasts appear to be more frequent in the blood (as in various anæmias and leukæmia, especially myelogenic leukæmia) the red discs should be in greater numbers also. The reverse is of course the case.

There is no explanation of, and there appear to be no anatomical arrangements for, the influx into the bloodstream of the erythroblasts as their seat of origin, while especially in pernicious anæmia the nucleated hæmoglobin bearing marrow cells exhibit the greatest diversity of shape and dimension, some being as large as 50 μ , there is no corresponding variation in the blood discs lying in close contiguity to, and presumed to have been formed from them.¹ The increased marrow metaplasia which is relied upon as proof of its normal blood-forming function is more evident in chronic disorders, of which destruction without proper regeneration of the blood-discs is the main feature, than in processes in which (as after severe simple hæmorrhages, or pure blood diseases like malaria) regeneration is both immediate and extensive. Indeed, the increased myelogenic activity may equally well be regarded as an exacerbation of a disease of which it is a part, equally as a sign of repair. The nucleated red discs of the marrow are no doubt normal. In infancy, under unwonted stresses of injury or disease, they may be conceived as attempting to function vicariously as true blood corpuscles; normoblast in the marrow, abnormoblast in the blood.

The function of the leucocytes as formers under unusual stimuli of free disc-shaped elements, closely resembling blood corpuscles though without hæmoglobin, and as the prime source of the blood-plates, from which ultimately the red corpuscles are developed, will, if confined, also afford, what has been lacking hitherto, a satisfactory explanation of the physiological leucocytes of infancy, of pregnancy, and perhaps even of digestion, as well as of the enormous output of the polymerously nucleated cells after severe hæmorrhages and other forms of blood destruction.

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THE LIFE CYCLE OF THE AMOEBA DYSENTERICA.

By F. GOLDSMITH, M.B., Ch.B.

Government Medical Officer, Northern Territory, Australia.

IN a certain type of tropical dysentery a microscopical examination of the mucus from a stool will show the presence of an amoeba (the amoeba dysenterica).

The amoeba, when full grown, is several times the diameter of a red corpuscle, when quiescent it is more or less round in shape, and when in active movement becomes elongated, and may be described as irregularly oval; it consists of an ectosarc which is well-defined and clear, and an endosarc which is transparent and colourless, or has a very faint greenish tinge; it contains a nucleus (with one or more nucleoli) granules, vacuoles and greenish bodies that have been described as "red corpuscles which appear to have undergone digestive liquefaction" (Muir and Ritchie).

The amoeba moves by protruding rounded pseudopodia of clear ectosarc sometimes to the extent of one fourth of its own diameter or more, then there is a rush of the contents of the endosarc towards and into the clear protruded part, and the whole of the after-part of the amoeba gathers up in the direction of the protrusion, locomotion to the extent of the protruded part is accomplished, and the process is repeated.

With an amoeba in full activity a fair amount of ground is covered in a short time. The direction of the movement varies with individual amœbæ; one will pursue a definite direction requiring constant shifting of the field for its observance; another will move in an irregular circular direction, keeping within a limited area; while another will content itself with protruding and retracting its ectosarc without much altering its position in the field.

Besides amœbæ, the other elements usually seen in dysenteric stools are:—

(1) Mucus or lymph cells. These are generally seen in masses with intervals of clear space between, and with patches of comparatively clear spaces scattered through the substance of cell masses in which the cells are absent or thinly spread.

(2) Red blood corpuscles singly or in rouleaux. These are most frequently seen in the intervals between the clumps of cells, they are unaltered in appearance, and in malarial patients the characteristic parasite can be observed in their substance.

¹ Cf. Muir, *Journal Anat. Phys.*, vol. ii., No. 3, p. 365.

(3) Bacteria of various kinds.

(4) Greenish bodies similar to those seen in the substance of the amoeba itself. These are usually seen singly embedded among the mucus cells or near the edges of the cell masses. They differ from red corpuscles in many ways: (a) They are usually seen singly and never in *rouleaux*; (b) though about the same size as the red corpuscle they vary in size more than the red corpuscle does; (c) they differ in shape more than a red corpuscle does, the latter may of course vary in shape if subject to pressure, but in the examination of fresh stool no pressure should be used, so their shape is usually normal, while the greenish bodies may take many shapes; (d) their colour is different, being distinctly green with no tinge of red; (e) their capsule is more distinct, and often a faint suggestion of a nucleus may be seen; (f) a side view shows a flat or bi-convex shape instead of the bi-concave shape of the red corpuscle; (g) the locality in which they are found in the field is different, being most frequent within or at the edges of the cell masses, while the red corpuscle is nearly always found in the clear spaces between the masses; (h) they are observed from among the cells and in the substance of the amoeba in the discharge from tropical abscess of the liver where red corpuscles are not in evidence; (i) they appear to possess slight amoeboid movements in themselves, which of course the red corpuscle does not.

These facts all tend to show that the greenish bodies seen in the endosarc of the amoeba are not red corpuscles that have undergone digestive liquefaction, but are entirely different bodies, and from my own observations, I think there is no doubt that they are embryonic amoebae, and it is by their means that the germs of dysentery are disseminated.

Regarding them as embryonic amoebae the question arises, are they altogether the product of the amoeba? or are they red corpuscles that have been taken up by the amoeba, the germ of reproduction planted into their substance and then discharged again? For my part, I regard them altogether as the product of the amoeba on the following grounds:—

(1) Though prolonged watching of an amoeba containing these greenish bodies showed me that one or two of these bodies were occasionally discharged, in no case have I seen a red corpuscle actually taken up into the substance of the parasite.

(2) The greenish bodies are present in the amoebae and discharge of tropical liver abscess for days after operation, while red corpuscles are few in number or not in evidence.

I base my opinion that they are real embryonic amoebae partly from evidence and partly from deduction.

The evidence is the result of observation. By careful watching of one of these bodies some steps in their development may occasionally be seen. The body (preferably one near the edge of a cell mass) is sometimes seen to possess in itself a sort of amoebic movement; the movement itself can rarely be seen, but repeated observations of the same body at intervals occasionally shows that a change in shape has taken place, the body, from being round, has become oval, pyriform, kidney-shaped, and perhaps becomes round

again. If it then starts to develop it enlarges, and at the same time begins to lose its distinctive green colour, its nucleus becomes more apparent, and by the time it is the size of a lymph cell it is almost indistinguishable from the surrounding cells; it enlarges still more, granules, and later on vacuoles, appear, and when about twice the diameter of a lymph cell the characteristic amoeboid movements start, but till then it remains rounded in shape, and it is not till it is full grown that the greenish corpuscular bodies commence to appear in its substance.

The evidence of deduction is based upon the fact that at present there is no satisfactory theory as to the method of dissemination of the amoeba by which disease may be spread. Taking it for granted that the amoeba is the pathological cause of this type of dysentery, and without entering upon the question whether or not the amoeba can be evolved *de novo*, it is undoubted that the disease is most frequently spread by means of the drinking water which in some way has become contaminated with faecal or dysenteric stools. All observers agree that after twenty-four hours of being passed the amoeba as such disappears from the stools and cannot be found by microscopic examination; this is my own experience too, but I find that the greenish bodies do not disappear, but persist, practically speaking, for all time. As it is very seldom that dysenteric infection in this way gains entrance into the body in such a short space of time, it is obvious that the amoeba, as such, is not the cause of the disease, but that it is due to the entrance into the body of some more resistant germ that has the power under favourable conditions of developing into the amoeba itself, and though it is impossible to observe this process within the body, it is extremely probable that the greenish body has the power of remaining latent for an indefinite period, and under circumstances favourable to its growth and development (such as a lesion in the mucous membrane lining the intestine) can develop into the amoeba, and by reproduction of its species bring on an attack of dysentery.

It would not be inappropriate here to give a short *résumé* of the epidemic of amoeboid dysentery which lately attacked the district surrounding Port Darwin, with a view of emphasising my remarks in relation to the latent period of the amoeboid germ.

Port Darwin is situated on the north coast of Australia, and is well within the boundaries of the tropics; the town is placed upon a peninsula, perhaps half a mile broad, with good natural drainage, the soil being mostly ironstone, with a direct fall into the harbour on either side. The water supply is derived from two sources, viz., rain water collected from the roofs of houses and stored in tanks, and from wells. I may here state that the epidemic was most marked among those that used tank water. The seasons are two, a wet and a dry, and the water collected in the wet season and stored in the tanks has to last through the dry season, till the next rainfall, probably five or six months. The epidemic broke out very soon after the first rains, when the dust and filth collected on the roofs during the dry season, were washed into the tanks.

Cause of the outbreak.—The population of Port Dar-

win, roughly speaking, comprises 2,000 people, of whom perhaps two-thirds use closets with buckets, which are emptied three times a week; the remaining population consisting of aborigines and the lower classes of Asiatics (Chinese, Malays, Philipinos, &c.), defæcate indiscriminately upon the ground on any vacant land near or in the town. These motions soon dry in the sun, mingle with the dust and with it are blown about in the air, and some, of course, deposited on the roofs of houses.

The simultaneous outbreak of dysentery in several parts of the town, following almost immediately the first rainfall after a particularly long dry season, seems to point to a common cause for the disease, and this theory, in my opinion, is most probably the correct one, especially when in the earlier stages of the epidemic the disease was almost exclusively confined to those who derived their drinking supply from the tanks. If this theory is correct it points to the presence of some germ capable of producing the amœba, but which has much greater latent and resisting power to time than has the amœba itself.

In the greenish bodies spoken of above we find a probable solution of the question; they are always present when the amœba is, and are of greater resisting power than the amœba, as they can be seen hours or days after all traces of the amœba have disappeared.

In this article I am only dealing with the cause of the onset of the epidemic, and not to its dissemination when the disease has gained a footing; when other causes come into play, one of the most common modes of the spread of the disease when once established is the ordinary house-fly, as mentioned by Sir William McGregor, in the *Brit. Med. Jour.*, October 6th, 1900. The stools are swarmed with this pest, and there is no doubt that they are the active agents in conveying the germs to the milk or other articles of food within their reach.

I would also like to mention the presence of crystals occasionally in the stools, more especially of patients in whom a large surface of bowel is attacked. These crystals, bearing a striking resemblance to the phosphatic crystals often seen in urine, occurred in two fatal cases shortly before death, and in one case after it became chronic, and in none of these cases where the crystals appeared was I able to find any live amœba. This might open up the question as to whether it is not Nature's own effort to effect a cure, and whether treatment by phosphates might not be advantageous. I do not intend here to go into the question of treatment, but suffice to say that where the disease did not appear to extend beyond the sigmoid flexure I found (in conjunction with medicinal treatment) injections of methylene blue, grs. x., sol. acid borici (saturated) Oii., followed by almost instant relief, and by an absence of live amœba in the stools for twelve hours, and two injections generally sufficed to effect a cure.

I regret exceedingly that no pathological laboratory was within my reach that would have enabled me to make experiments with regard to the cultivation of the amœba. I think a broth of the large intestine or liver of the cat (which seems to be susceptible to its action) would probably show that cultivation is possible.

A STUDY OF LEPROSY IN THE INDO-CHINESE PENINSULA AND YUNNAN.

By DR. E. JEANSELME.

Review by DR. OSWALD BAKER, Lt.-Col., I.M.S. (ret'd.), London.

DR. E. JEANSELME's brochure, entitled "A Study of Leprosy in the Indo-Chinese Peninsula and Yunnan," is the outcome of a mission, with which he was entrusted, in 1898, by the Minister of Public Instruction and the Colonial Minister, having for its object the submission of a report on the best means of dealing with leprosy in the French colonies in the east. With this object in view Dr. Jeanselme proceeded to the Indo-Chinese peninsula, that vast extent of country bounded by Yunnan on the north, by the China Sea on the east, by the Bay of Bengal on the west, and whose southernmost extremity is Singapore, an enormous tongue of territory, in which almost all the eastern possessions of the French nation are situated. He visited the important centres of population in Cochin China, Tonkin, Annam and Cambodia. From Hanoi, in Tonkin, he travelled through Yunnan to Bhamo, and thence descended the Irrawaddy river until he arrived at Rangoon. From the latter town he went by sea to Penang and Singapore, and finally regained Cochin China, completing a circular journey which extended the entire length and breadth of the peninsula. He spent a year and a half in pursuit of the task he had taken in hand.

Dr. Jeanselme has embodied the results of his labours in a small book, published by Messrs. Carré and Naud, of Paris, under the title given above, which it is to be hoped the authorities responsible for the administration of the French colonies have taken into their serious consideration, and which, moreover, should be read by every one interested in leprosy. The subject matter of the volume has been conveniently arranged into three chapters, of which the first and second are of considerable interest. The first chapter is devoted to a consideration of the degree of prevalence of leprosy throughout the Indo-Chinese peninsula and Yunnan; while in the second, which is headed "The Struggle with Leprosy in the British Colonies," the author writes, in a practical manner, of the various Leper Acts which have been brought into operation in many of the territorial possessions of the British Empire, and he presents his readers with a useful collection of the cardinal sections of these legislative enactments. The final chapter of the book consists chiefly of the measures proposed by himself for the control of leprosy in the provinces of the peninsula belonging to France, which are nearly all based on the fundamental proposition that leprosy is communicated *exclusively by contagion*. In the interests of British colonial medical officers it seems advisable to give a full epitome of the contents of the first two chapters.

Chapter I. Dr. Jeanselme points out that Indo-China is largely inhabited by agricultural races which congregate on those fertile areas that are to be found in the valleys and deltas of the principal rivers in the peninsula. In these situations he found leprosy universally prevalent, the degree of prevalence being in strict geometrical ratio to the density of the population. In Cochin China alone the official returns gave a total of 3,580 lepers. In Annam there were

numerous lepers, especially at Hué and in the villages near the sea-board, but leprosy was not found on the high hinterland of Annam owing, according to the author, to the infrequent communication between it and the low-lying endemic areas.

In Tonkin leprosy is even more common than in Annam. It was found that whereas under native rule lepers were confined within definite boundaries, since the French annexation many of these inhabitants had left their leper settlements and were dwelling among healthy people. An encampment of 150 lepers was seen, however, not far from Phuc Nhac, in the province of Ninh Binh, and one in Hanoi itself, with 200 lepers who had, however, living with them an equal number of healthy people.

In Cambodia and the Laos country, where the population is scanty, leprosy everywhere exists, but only to a slight extent, and there are no leper villages. *The people, however, fear contagion and never touch a leper: they banish lepers who have ulcerations to the jungle, or to a sand-bank in the middle of the river, or to a raft moored close to the shore.*

Small local epidemics of recent origin were *here and there* met with. In the village of Ban-Hat-Sao, with about sixty inhabitants, leprosy was unknown until twenty years previously, when it appeared in a Chinaman born in the village, but whose father was a native of Southern China. Three years later another native Chinaman, whose father was also born in China, manifested the disease. The first Chinaman married a Lastian widow and communicated leprosy to her and to her son by a former husband, and this Chinaman also communicated the disease to his niece. With regard to this and similar outbreaks Dr. Jeanselme remarks: *"The study of these epidemics is very interesting, for it affords certain proof of the relationship of cases, and enables one to witness the prominent rôle of contagion in the formation of leprosy centres."* The author is forced to the conclusion that there is no denying the important part played by Chinamen in the dissemination of leprosy.

With regard to the French possessions in Indo-China, it is estimated that the number of lepers is no fewer than from 12,000 to 15,000, and as the population is set down at 20,000,000, the proportion of lepers to healthy individuals is as 1 to 1,500. As far as Cochin China alone is concerned, there is one leper to every 300 or 400 inhabitants.

In Bangkok, the capital of Siam, with a population of from 500,000 to 600,000, there are at least 1,000 lepers.

In Yunnan the population is sparse and scattered, and although the disease is spread all over the country, no definite groups of lepers were met with. In Yunnansee, the capital, there were several lepers among the 800 cripples sheltered in the Imperial Asylum.

With regard to Burmah, it is said that the immense and fertile valley of the Irrawaddy is a vast centre of endemic leprosy. At Mandalay there are at least 500 to 600 free lepers in addition to 250 confined in the two leper asylums of that town. At Prome the steps leading to the large Pagoda are covered by lepers, who exhibit their ulcers and beg for alms. Lower Burmah swarms with lepers mutilated by the disease, of whom only about 60 are isolated in the Rangoon asylum.

In the Straits Settlements leprosy has become so formidable that the people are calling out for the compulsory isolation of all lepers. Two asylums are already in existence there, one for Malays and the other for immigrant Chinese.

In summing up the general prevalence of leprosy in the Indo-Chinese peninsula, Dr. Jeanselme writes as follows:—

"There are no precise data on which the number of lepers inhabiting the Indo-Chinese peninsula can be estimated with any approach to accuracy. In putting, however, the total number of cases at 25,000 I am certain of understating the facts.

"Although most of these unfortunates belong to the French possessions, we have hitherto taken no serious measures to minimise the effects of contagion. The number of lepers cared for in the different charitable institutions of our colonies is really insignificant, and the leper villages which existed in Tonkin before the annexation render no real service.

"The English administration, on the other hand, has made praiseworthy efforts. It subsidises in Burmah leper asylums, in Mandalay and Rangoon, worthy of the name, and at Jerajak, near Penang in the Straits Settlements, it supports an island settlement for lepers which enforces the strictest isolation."

Chapter II. In this chapter which, as already stated, is entitled "The struggle with leprosy in the British Colonies," Dr. Jeanselme, after again drawing attention to the fact that leprosy is a contagious disease, and after pointing out that this circumstance must influence all the regulations that are enforced with a view to the prophylaxis of the malady, proceeds as follows:—

"The English who, equally with the Romans, possess in the highest measure the gift of ruling conquered nations, have long since taken important steps to control endemic leprosy, which desolates their vast colonial empire. The numerous laws which have been imposed on their subjects during the last fifteen years show the energy they have displayed in struggling with this scourge. In thus acting they have been influenced as much by considerations of political economy as by motives of philanthropy.

"Each human life represents capital. Now every leper becomes sooner or later not only unproductive but a charge on the community; moreover, the reputation for unhealthiness which is acquired by countries desolated by leprosy diverts commercial enterprise and imperils the future of the colony. All these losses added together amount to millions of money. Although these ideas are self-evident, and very simple, it is by no means useless to enunciate them. The medical man too often neglects to consider the economic side of sanitary measures, and when he asks Government to make great pecuniary sacrifices, it is his duty to point out the pecuniary profit which the authorities are entitled to expect if they adopt the measures proposed. . . .

"The English, being intelligent observers, are careful not to impose uniform and symmetrical legislation in all their colonial possessions. They have everywhere and in all respects observed the principles of autonomy, only interfering to an extent necessary to

safeguard their authority and protect their material interests. This principle of the least possible intervention, which has decentralisation for its corollary, has been applied by them to the solution of the problem of the prophylaxis of leprosy."

Seeing that the French have taken no steps to arrest the spread of leprosy in their own colonies, it is not surprising that Dr. Jeanselme should consider the action of the British Government deserving of praise. But, bearing in mind the fact that no attempts were made in the British colonies to legislate for the suppression of leprosy until fifteen years ago, whereas these territories, with their endemic centres of leprosy, have formed part of the British empire for many generations, it cannot reasonably be maintained that the attitude of the authorities concerned, in respect of the prophylaxis of leprosy has been characterised by energy. Nor is it probable that the action of Government in legislating for lepers has its origin either in motives of political economy or of philanthropy. It is rather due to the pressure of public opinion supported by a growing belief in the contagiousness of the malady.

In the consideration of the various Acts relating to lepers which have been introduced in several of our colonies, Dr. Jeanselme has, in consequence of the diversity of race and climate which these widely-separated territories present, arranged them into four sets.

(a) The first applies to the Australian colonies and the Mediterranean possessions of Cyprus and Malta, where the white race increases by multiplication as well as immigration. The chief of this series are Act 1890 of New South Wales, and Act 1892 of Queensland. These two Acts are almost identical, and the main provisions of the latter are summarised as follows:—

Section 4.—Whenever there is any reason to believe that any person is suffering from leprosy, the owner or occupier of the house shall immediately report the case in writing to the nearest police magistrate who shall send a report to the Minister, and also forward a copy of the same to the Central Board of Health. Whenever a medical practitioner finds a case of leprosy he is bound to make similar reports. All neglect about this rule is punishable by a fine not to exceed £100.

Section 8.—The Minister shall direct the examination of the suspicious case by one or more medical practitioners, and if the diagnosis of leprosy is confirmed, he shall have the leper sent to an asylum. If the leper declines to obey, or escapes, or attempts to escape, he may be arrested by such police as is necessary, and taken to the asylum.

Section 9.—All persons intentionally disobeying an order, interfering with its execution, entering within the limits of an asylum, communicating with persons detained there, or interfering with them without reason, are punishable with a fine of from £10 to £20.

(b) The second set of Acts relates to the British possessions in South Africa, where Europeans can also live and multiply, but, unlike Australia, where leprosy is already very prevalent.

The subject of the prophylaxis of leprosy in South Africa was considered in all its bearings by a special Commission which met at the Cape in 1894-5. One of the conclusions arrived at was that *there are no methods other than complete, or partial isolation by which the progress of leprosy can be effectively stayed*, and the Commissioners recommended that the notification of every case of leprosy should, with a view to isolation, be made compulsory. The Commissioners, however, advised that no attempt should be made to deport all lepers to a single asylum far from their homes, such as that on Robben Island, but that isolation should be carried out in private dwellings, in licensed houses, and in leper villages or locations.

The Leper Act of Natal (1890) directs the compulsory isolation of all persons suffering from *infectious leprosy*, a definition given only to advanced cases of the disease, who may apply for admission into an asylum, or whose cases are brought to the notice of a magistrate. The Act, however, gives magistrates authority to isolate lepers regardless of their disease under the circumstances alluded to in the following sections:—

Section 14.—Whenever it is reported to the Governor that leprosy is prevalent in any locality, he may direct the local magistrate to make any enquiry. Leprosy shall be deemed prevalent whenever more than five persons residing within a circle three miles in circumference are affected by the disease. The district civil surgeon shall make the enquiry and shall submit a report, giving in each case the sex and approximate age.

Section 17.—The Governor after taking cognisance of the conclusions of the report may direct the persons affected to be sent to a leper location.

Section 18.—The magistrate shall deliver to every adult leper, or guardian of a minor leper, a notice directing the person affected to proceed to a leper location within a month from the date of notice, and remain there until released according to law.

Section 20.—This section enumerates the methods of appeal open to persons who have received an order to proceed to a leper location.

Section 21.—The magistrate may authorise members of the leper's family who wish it to accompany him to the location. He must, however, first satisfy himself that those who wish to accompany the leper are actually related to him.

Hindu or other dark-coloured immigrants suffering from leprosy are prohibited from entering the colony.

(c) The third division of the Leper Acts, in which the essential provisions are for the most part similar, embraces Acts which apply to the West India Islands, British Guiana, and the Straits Settlements. The majority of these Acts contain clauses providing for:—

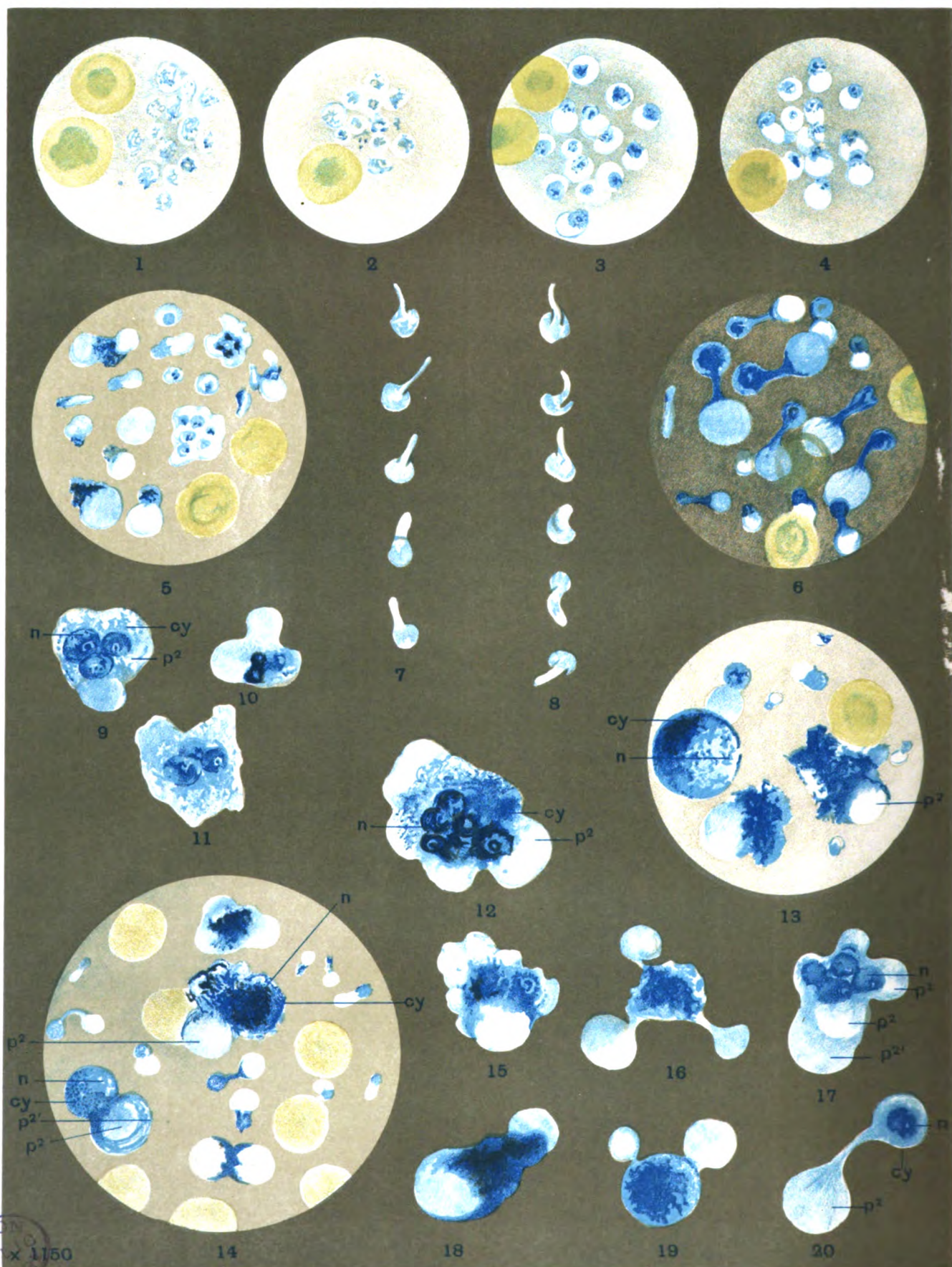
(1) Compulsory detention of vagrant and pauper lepers.

(2) Isolation of pauper lepers at the request of those responsible for them.

(3) Prohibition of lepers to exercise certain trades and occupations.

(4) Prohibition to bring lepers into the colony.

The most comprehensive of these Acts is that which relates to the Straits Settlements, and which is based on the recommendations of the Leprosy Commission



Illustrating Dr. Leonard Braddon's Article on "Some Undescribed Hæmatozoa of Malaria in the Malay Peninsula and on Blood-Plates as Hæmatoblasts."

The First Plate and Article were issued in the "Journal of Tropical Medicine," September 16th, 1901.

DESCRIPTION OF PLATE II.

Figs. 1, 2.—Two groups of ordinary blood-plates after 2¹ in methylene-blue and potash cit. solution. [M. B., May 21st, 4 p.m., no fever.]

[Plates of all sizes very numerous, that figured predominating. Polymorphonuclear leucocytes very few, a few 2 to 4 nucleated, and single nucleated leucocytes present. Plates chiefly found in closely packed groups as depicted.]

Figs 3, 4.—Same groups seen ten minutes to a quarter of an hour later.

Fig. 5.—Composite field, drawn from actual observations made in one specimen, from a person not affected with fever at the time. Bodies forming every grade between blood-plates and mature discs are observable; the smaller with the nuclear matter from which they arise [or which is extruded from them] still attached; the larger free.

[Every size of plate up to fully formed red discs was observed. Müller's dust abundant, especially about the larger aggregations of platelets. Author's blood, May 21st, 9 p.m.]

Fig. 6.—Composite field from one specimen. Appearances after staining one quarter of an hour. Extended separation of colourless discs from cyano-plasm ["extension of nuclei"].

Many larger free discs were also found. The separated cyano-plasm is spherical in form, except in one instance, where it is altered by the stress of adhesion to the slide.

The smallest bodies are platelets, showing a similar process. From a case of malarial fever having mycoid parasites [Ahmat, Malay, aged 27. Temp. 103° F.].

Figs. 7, 8.—Represent two "plates" in which, from alteration of position, the flattened nature of the disc-process, and the more or less spherical form of the

remaining cyano-plasm are apparent. [Author's blood, May 9th.]

Figs. 9, 10, 11, 12.—Polymorphonuclear leucocytes, showing stages of differentiation of plate processes from the cyano-plasm. The nuclei, with nucleoli deeply stained, remain distinct.

[These and the other remaining figures were all taken from one specimen, six hours after the fastigium of an attack of malarial fever. Mrs. G., June 24th.]

Fig. 13.—An actual field, showing several blood-plates from which discs are being differentiated; a lymphocyte of which nuclear part is unstained, and two lymphocytes in which blood-plates are being differentiated from the cyano-plasm.

Fig. 14.—Another actual field, the central figure in this shows how little the plate formation can be regarded as due to a "nuclear extrusion," the nucleus being far larger than the "plate" or "all" remaining.

Near the bottom of the figure the two perfectly clear plates seem to have been formed from a very small centre of cyano-plasm.

Figs. 15-20.—Various examples of formation of plate-processes from cyano plasm of polymorphonuclear cells, and of lymphocytes. In 16 and 20 such discs have nearly, in 19 two have completely, become separated from the cyano-plasm.

In some of these, the larger processes (Fig. 17, pl. II.), (Fig. 14, pl. II.) absorb some stain, owing possibly to incomplete differentiation. The unstained processes appear to be most differentiated.

Magnification employed about 1,200 diameters (obj., Reichert, $\frac{1}{8}$ in., eyepiece, Watson B.); the drawings from which the plate is copied were made in colour freehand, sizes being checked by camera lucida. Owing to the distance of the paper the magnification has become a little exaggerated in the drawing.

which met at Perak in the year 1893. The chief sections of this legislative measure, which is styled "The Straits Settlement Ordinance of 1899," are as follows:—

Section 6.—Whenever a person is convicted of an offence punishable under Section 32 of the Summary Criminal Jurisdiction Ordinance 1872 (Vagrancy) and the magistrate is satisfied that the person so convicted is a leper, such magistrate may, under his hand and seal, direct the detention of such leper in a leper asylum until he is released by order of the Governor.

Section 7.—When it appears to a magistrate that a person within the limits of his jurisdiction is probably a leper, it shall be lawful for such magistrate on the requisition of any person legally bound to support the alleged leper, to make enquiry into the case, and if such magistrate is satisfied that the alleged leper is a leper, and he is or will become a burden to the person legally bound to support him, such magistrate may by authority under his hand and seal direct the detention of such leper in a leper asylum until he shall be released by order of the Governor, and the person legally bound to support such leper shall pay Government monthly, during the detention of the leper, such sum for his maintenance as the magistrate shall order after considering all the circumstances of the case.

Section 3.—The Governor-General in Council may by notification in the official gazette prohibit the exercise of certain occupations by lepers, such as those of:—

Butcher, baker, cook, or any trade or occupation in which the person employed handles articles of food or drink, drugs, medicines, or tobacco under any form whatsoever.

Washerman, tailor, or any trade or occupation in which the person employed manufactures, or handles, clothes.

Barber, or all other trades, or similar occupations in which the person employed comes into contact with another person.

Servant, nurse, jinrickshaw coolie, driver licensed to drive a hired carriage.

Section 4.—Any leper who enters a hired carriage, jinrickshaw, or other public vehicle, or who lodges in a boarding house or a lodging house, or who bathes in a public bath, shall be guilty of an offence, and shall be punishable on conviction by a magistrate with a fine not exceeding fifty dollars, and may be sent to a leper asylum to be detained there until released by order of the Governor.

Section 14.—Any person received into an asylum in pursuance of this ordinance may be detained there until he is transferred or released, and in case of escape he may be arrested by the superintendent or by any police officer or servant of the leper asylum, or by any police officer, and again sent to and received and detained in the asylum.

Section 11.—A leper who is not a native of the Straits Settlements shall not be landed in any part of the colony, and the master or other person in charge of the ship who permits, or omits to prevent, the landing of any person whom he knows or has good reason to believe to be a leper, shall be punishable on conviction by court of two magistrates, with a fine not exceeding 500 dollars.

Section 15.—The penalties incurred by the alleged leper, by the persons who landed him, or employed him in a prohibited occupation, &c., shall only be imposed on certificates delivered by two qualified medical practitioners attesting that the alleged leper is really a leper.

(d) The fourth and last division of the Leper Acts shows what legal measures have been introduced into British India and its dependencies for the suppression of the disease, and for the care of lepers.

In the year 1890 an important commission was sent out to India under the auspices of the National Leprosy Fund. Its members spent considerable time in the country, and ultimately issued a voluminous report, in which the following recommendations found a place:—

(1) The voluntary isolation of lepers.

(2) Prohibition for lepers to follow certain occupations.

(3) Enforcement of municipal regulations against vagrant lepers.

(4) Enlargement of existing asylums, and creation of new asylums in the neighbourhood of towns.

(5) Foundation of colonies or farms in rural districts.

(6) Institution of orphanages to receive the children of lepers.

Shortly afterwards the Bombay Municipality, under the provisions of some old local Act relating to vagrants generally, arrested all mendicant lepers and confined them in a leper asylum. This circumstance is not mentioned by Dr. Jeanselme, but it deserves to be recorded, not only because lepers were then for the first time in the annals of British rule in India compulsorily segregated, but also because the success of this measure in Bombay made the task of legislating for the isolation of lepers in other parts of the Indian Empire a very simple matter. In 1894 the Bengal Government passed a Lepers Act providing for the compulsory isolation of vagrant lepers, and forbidding lepers to engage in certain occupations. Burmah and other local governments asked that the Bengal Act should be extended to them, but the Governor-General in Council, considering that one uniform Act would be preferable to separate Acts, published in 1896 a Leper Act which could be applied to the whole of India. This Act has since then been completed by additions, which do not modify its essential provisions, and is called the Leper Act of 1898. In principle it extends to the whole of British India and its dependencies, but in order that it may come into force in any province, it is necessary for the Local Government to declare by notification in the official gazette that it extends to such province.

This Act provides for the isolation of vagrant lepers, and prohibits lepers from following certain trades and occupations.

The important sections of the Act are as follows:—

Section 6.—In every area in which the Local Government has by notification decided that pauper lepers shall be sent to an asylum, any police officer shall arrest without warrant any person who appears to him to be a pauper leper. The police officer shall immediately take, or cause to be taken, the person so arrested to the nearest police station.

Section 7.—The suspected person shall be brought without delay before an inspector of leprosy. If the inspector finds that the person submitted for examination is not a leper as defined in Section 2 (*i.e.*, a leper in whom the process of ulceration has begun), he shall give him a certificate in form A, and the leper shall then be immediately released.

CERTIFICATE A.

I, the undersigned _____, certify that on the _____ day of _____ at _____ I personally examined _____, and that the said _____ is not a leper as defined in the Leper Act, 1898.

Given under my hand this _____ day of _____, 189 _____.
(SIGNATURE).

Inspector of Leprosy.

If, on the contrary, the Inspector is of opinion that the person is actually a leper as defined in Section 2, he shall give a Certificate in form B to the police officer, in whose custody the leper is, and the leper shall then without any unnecessary delay be sent before a magistrate empowered under the Act.

CERTIFICATE B.

I, the undersigned _____, hereby certify that on the _____ day of _____ at _____ I personally examined _____, and that the said _____ is a leper as defined in the Leper Act, 1898, and that I base this opinion on the following reasons, particularly _____

Given under my hand this _____ day of _____, 189 _____.
(SIGNATURE).

Inspector of Leprosy.

Section 8.—If it appears to the magistrate according to Certificate B, that the person arrested is a leper, and that he is moreover a pauper, he shall give him a certificate in form C, and shall have him conducted to the asylum by a police officer.

CERTIFICATE C.

To the Superintendent of the Leper Asylum.

As it has been proved that _____ is a pauper leper as defined by the Leper Act, 1898, you are hereby authorised to receive the said _____ into custody, together with this order, and keep him until he is released by order of Government, or of the District Inspector.

Given under my hand and seal this _____ day of _____, 189 _____.
(SIGNATURE).

Magistrate.

Section 9.—If the person declared to be a leper objects to this decision, the magistrate may, after examining the inspector of leprosy, maintain or alter his order, or he may direct that the suspected person be placed under observation.

Finally, if a relative or friend of the pauper leper undertakes in writing to give him proper care and prevent him from begging, the magistrate shall entrust the leper to the relation or friend: if he thinks it necessary he may demand security.

The foregoing *résumé* of the cardinal features of the various Leper Acts in force in the different possessions of the British Empire is of considerable interest, and may possibly be of service to those who are unable to consult the original Acts.

The rigour of the Queensland Act making the

omission to notify a case of leprosy an offence punishable with a fine of £100 is in marked contrast to the Acts which aim only at the segregation of mendicant lepers who have no visible means of subsistence.

There is much in Dr. Jeanselme's small book to which no reference has been made, but colonial administrators who contemplate leprosy legislation might study its pages with advantage.

It is not encouraging to read that in the asylums at Mandoloo and Jerajak (Straits Settlements) the treatment of the disease has been found ineffective, and has therefore been given up.

TROPICAL FOOD ADJUNCTS—PREVENTION OF DISEASE. SPICES.

By T. M. MacKNIGHT.

Las Palmas, Canary Islands.

I HAVE often wondered why spices are so plentiful in the tropics, but while engaged in writing a book on tropical food I have been enabled to solve the mystery. In my desire to let this information be known as soon as possible, I now write a special article on this subject, which is of such immense importance.

In tropical countries, which lie between latitude 23° South and 23° North of the Equator, the inhabitants use spices daily with their food just as we use pepper, salt, &c., without any thought of their antiseptic value, but simply because they are pleasant to the palate and cause their food to be more agreeable. When the spices are eaten with the food a certain beneficial effect is caused to the digestion, *viz.*, stimulant and carminative. But there is a secondary effect, which is perhaps even more beneficial, in the fact that the volatile oil passes out from the body, mostly unchanged, through various channels, but chiefly through the lungs and skin. So that in the tropics Nature has provided antiseptics which, in passing out by the lungs and skin, kill the hurtful microbes which might be breathed in, and also prevent, to a great extent, the attack of mosquitoes. It is a well-known fact that insects, including mosquitoes, dislike volatile oils and will probably not attack an individual using spices as a food adjunct.

Besides the general use of aromatics or spices, each country has its compounds or combinations as follows: In Africa, Malagueta pepper, &c., with baobab leaves; in South America and the West Indies, "cassareep," which consists of concentrated mandioca juice with well-known aromatic; in the East Indies, "curry powder," consisting of cardamoms, turmeric, cloves, cinnamon, &c.; in South East Asia, "pan," which consists of betel pepper leaf, betel nut and lime. The betel pepper leaf has two volatile oils, and the betel nut contains a little volatile oil. The lime probably acts as an astringent on the bowels, which have sometimes a tendency to relaxation—tropical dysentery.

It is interesting to notice that spices grow where there is a high rainfall combined with much heat, conditions under which malarial influences prevail.

PART II.

Mitchell Bruce, in his "Materia Medica," page 243, says that "the aromatic volatile oils are in the mouth antiseptic, and also increase the circulation of the blood, exciting the nerves of taste and smell (flavour) powerfully. Several results of the first importance in digestion follow, viz., increase of saliva, increase of mucus, reflex increase of blood to the surface of the stomach, stimulation of appetite, increase of relish by pleasing flavour, in a word, desire for, enjoyment of, and digestion of food. In the stomach the effect on the vessels and nerves is continued, and here it is generally described as carminative. Besides causing increased flow of gastric juice by stimulation of the mouth, these substances are powerful stomachics in several ways. The blood vessels of the surface of the stomach are dilated and the nerves of the same are first excited, then soothed, the contents of the stomach, if decomposing, as in dyspepsia, are *partially disinfected*. Their reflex influence is equally important. The muscular coat of the stomach is stimulated, thus increasing gastric movement, *expelling flatulence*, heart vigour increased, spinal and cerebral centres temporarily excited. Thus they are general stimulants. In the intestines they are still found partly unabsorbed, increasing local functions, stimulating intestinal movements, and *expelling flatus*. They thus prevent pain or spasm (colic). They enter the blood unchanged and whilst partly oxydised by the red blood corpuscles, leave the circulation mainly unaltered. They are excreted by the lungs, skin, kidneys, liver, and probably by the bowels. In passing through those structures stimulate and disinfect them." As it is now a well-known fact that the microbes of malarial fevers, &c., are in the blood, it is quite obvious that if the volatile oils enter the blood chemically unchanged and leave it again mostly in this condition, they will exert their antiseptic influence on the disease germs and kill them. Of course what applies to the oils in their isolated condition will apply to them when still in the bark or seed, &c., used as spices.

Richet, in his "Dictionnaire de Physiologie," 1897, vol. i., p. 608, states that "Miguel has experimented with antiseptics in order to see which are the most powerful." The result has been to show that bichloride of mercury, &c., are the most powerful; *volatile oils* and hydrocyanic acid (prussic acid) are placed in the next class; carbolic, oxalic, tartaric, and citric acids in the third class; boracic acid and hydrobromide of quinine in the fourth class.

Foster (U.S.A.) "Practical Therapeutics," vol. i., p. 448, under "Germicides," states that "Cadeac and Meunier have experimented with about ten volatile oils in order to ascertain the *length of time* required to kill the microbes of typhoid fever. The only spice oils tried were oil of cinnamon and oil of cloves. These beat all the others in the rapidity with which they killed the microbes." The microbes of malarial fevers, cholera, and tropical dysentery, so far as I know, have not been experimented with, as they have only comparatively recently been thoroughly classified. All microbes of the class referred to belong to the lowest forms of animal life, viz., the protozoa—and probably antiseptics act

similarly on all. The malarial microbe is easily killed outside the body, in fact it is difficult to keep alive, therefore in the body the volatile oils will act easily upon it.

The most recent researches in medicine show that the three principal diseases in India are fevers, cholera and tropical dysentery. In all these complaints the microbes are present in the corpuscles of the blood and have entered the body by the lungs, with the food and water or, as recently proved by Major Ross (Director of the School of Tropical Diseases, Liverpool), by the bites of mosquitoes. Allbutt, in his "System of Medicine," 1897, vol. ii., p. 309, states that these microbes are the "immediate cause" of the disease. They have recently been identified, classified, and have received various names. Quinine, as Mitchell Bruce, in his "Materia Medica," p. 265, and Bartholow's (U.S.A.) "Materia Medica," p. 203, informs us, acts "*as an antiseptic and kills the microbe*." This drug constitutes the usual medical treatment of malarial fevers, but no one has ever realised the great value of the spices which are used as a food adjunct and not as a medicine. They act as a constant preventative to the above diseases by killing the microbes if they enter by the lungs, alimentary canal, or skin.

Bartholow's (U.S.A.) "Materia Medica," 1896, p. 366, states "there is a distinct relation between the *antiseptic and antipyretic* properties of various members of the group of *antiseptics*, as they have the power to depress temperature in the same ratio as they are active in *destroying* disease germs or ferments."

G. F. Butler (U.S.A.) "Text book of Materia Medica," 1896, Section "Aromatics," says that "the aromatics (spices) are powerful antiseptics and possess properties very similar to the more typical antiseptics." He also goes on to state that "during the cholera in Paris and London, perfumers were immune," and also that "when the Dutch destroyed the clove tree in one of their East Indian colonies it suffered from epidemics and disorders unknown before."

PART III.

Peron, in his "Voyage aux terres Australes," "was convinced that he preserved his health during a long and difficult voyage by habitual use of *betel*; while his companions, who did not use it, died mostly of dysentery."

Bancroft, in his "Natural History of Guiana," states "it is a general mistake that spices are detrimental, whereas nothing is more productive of health, and we find Nature provides and has taught the inhabitants their use. They season their food with a great quantity of *pepper (chillies)*. By this practice the Indians wholly preserve themselves from intermittent fevers which are endemic to the other inhabitants of Guiana who do not imitate them."

It is recommended that, considering the great importance of this subject, every museum and botanical garden in the tropics should have specimens of its spices, giving also the local as well as the scientific name, with a few remarks as to the mode of preparation for consumption.

The author would be glad to receive further information, as it is certain that each country must have other products of a similar nature which have not been recorded by travellers and explorers. Any bark, leaf, seed, or root having a perfume, pleasant or unpleasant, and commonly used as a food adjunct, should be noted.

British Medical Association.

(Continued from p. 359.)

CAUSATION OF ENTERIC FEVER IN INDIA.

By ANDREW DUNCAN, M.D., B.S.Lond., M.R.C.P., F.R.C.S.
Lieutenant-Colonel I.M.S. (retired); Physician, Seamen's
Hospital Society, Royal Albert Dock.

THE ETIOLOGY OF ENTERIC FEVER IN INDIA.

THE subject of the etiology of enteric fever in India is one that has been provocative of a vast amount of discussion, and has in its time excited the evolution of very curious theories to account for its increasing prevalence. I would, however, venture to submit that, if there is one country in the world where we would expect to find enteric fever rampant, it is India, and that it is rather a matter for surprise that the present large number of men who fall victims to the disease is not larger.

Before laying before you what I consider are the essential factors in the causation of the disease, I will briefly comment on some of the theories that have been upheld concerning enteric in India.

(1) *The Vicarious Theory of Martin.*

(1) *Hepatic insufficiency.* In consequence of an excess of work being thrown on the hepatic system, either by an absorption of putrid matter or otherwise, there is an increased demand on the hepatic function, responded to at first by an increased activity of that function. Soon, however, the liver is unable to come up to time, so to speak, and can no longer bear the strain of eliminative work thrown on it. The second element now comes in—namely, (2) a vicarious and abnormal activity of the intestinal glands, supplemental to the hepatic insufficiency. This eliminatory function of the intestinal glands at length leads to a suppurative enteritis. This vicarious action is, in its turn, furthered by the third element—namely (3), an idiosyncrasy or proneness of the glands to this abnormal function.

In this way Dr. Martin would explain the origin of enteric fever from "increased temperature," or its occasional "spontaneous origin," and also its non-occurrence or rarity amongst the natives of tropical climates.

This theory requires little to refute it, for the glands affected in typhoid fever are the glands of Peyer; and the glands of Peyer are absorptive and not eliminative.

(2) *The transformation theory of M. Colin.*—This French authority held enteric fever to be a unique malady in the tropics, and to result from the transformation of fever primarily paludal into enteric fever. He also held that in the tropics enteric fever may be spontaneously developed by its transformation from all acute febrile states. Now, if this were true, I would certainly agree with M. Colin that the enteric fever of the tropics is a unique malady, for we are here asked to believe that the sporozoon of malaria can become transformed into the bacillus of Eberth. But apart from the zoological difficulties of this sup-

position, the disconnection of enteric with malarial fever has been frequently noticed. Take, for instance, Demerara and British Guiana: were the two fevers allied, these two localities should have furnished a high ratio for both diseases, whereas, as Welch shows, the contrary is the case.

(3) *The theory of Surgeon-General Moore.*—The late Surgeon-General Moore, of Bombay, did not believe in the specific nature of any fever. According to him, enteric fever was simply a phase of fever, not a specific disease, while the enteric spots are only a petechial eruption. The eruptions of enteric, typhus, scurvy, and purpura are identical. Now, of course, on this theory, cases of enteric fever would increase and multiply; but it is only necessary to point out as regards the identity of the eruption, that that of the latter three does not disappear on pressure.

(4) *The theory of Sir Joseph Fayrer.*—This authority thus writes: "To attribute all cases of enteric fever to faecal poisoning is erroneous and dangerous; that geographical position and climatic influences, heat, moisture, organic decomposition, miasmata, and a variety of aerial and telluric conditions are more likely than a specific cause in India."

This theory may be considered jointly with:—

(5) *The climatic theory*, which states "that climatic influences acting on young and undeveloped constitutions, predisposed in some way specially to develop typhoid, may start the disease" (Clark, quoted by Fayrer), and that "typhoid fever in the British soldier in India is primarily due to climatic influences" (Bryden). Summarily stated, this theory is that climatic agencies acting on a young soldier recently arrived in India will start the disease. And with this is interwoven the influence of "atmospheric waves" of other writers. I believe by some observers the idea that a hot climate can *per se* start specific disease is still held, although, luckily for the sojourners in India, this dangerous theory is year by year less held. One might as well say that a hot climate could produce the various fauna and flora *per se* without the specific seeds thereof. Dr. Billings, of America, tersely criticises this idea in an incisive manner, when he states that "epidemic constitution is merely another phrase for want of knowledge"; whilst Dr. Edmund Parkes, the former revered Professor of Hygiene at Netley—a man whose memory will ever live in the minds of those who had the good fortune to sit under him, and of whom it may be truthfully said that his lovable disposition was combined with one of the acutest, if not the acutest, intellects that ever graced the medical service of the army—rightly spoke of such causation as belonging to the "mythical region of epidemic constitution."

(6) *The theory of Surgeon-General Gordon, of Madras.*—This officer held that there was no such disease as enteric fever in India at all.

(7) *The theory of Sir Antony Home.*—Subsequent to the last expression of opinion was that of this authority. He ordered that all fatal cases of fever in which at the *post-mortem* examination any ulceration of the intestines was found were to be returned as cases of enteric. I cannot better criticise this view than in the words of the late Dr. Wall of the Indian Medical Service: "I believe that a large proportion of

cases returned as typhoid fever have no right to that name. If a man die in India after having an elevated temperature and an ulcer be found in his intestine, the case is at once called typhoid. But it takes a great deal more than an intestinal ulcer to make a typhoid fever. I have seen many cases that could not with certainty be referred to any type of fever, but which had, on the whole, more resemblance to remittent than any other, and which were found after death to be coincident with intestinal ulceration, but an ulceration distinctly not typhoid. It was an irregular ulceration, by no means selecting the site of Peyer's patches, and very often encircling the intestines; and my experience is that this form of ulceration often occurs in cases that would better bear the name 'remittent' than anything else."

It is proverbially more easy to criticise than to construct a theory; but as regards the prevalence of enteric fever in India, I would lay down the statement that if there ever were a country where we should expect the white man to suffer from this disease, that country is India. And this statement holds good whether you hold with Murchison the "pythogenic theory," or with others the specific theory of fever. The factors concerned in the evolution of this fever in India are to be found in the following circumstances:—

(1) The yearly advent into the country of a large body of subjects at an age most liable to the disease.

(2) The country presents an environment to these subjects also most favourable to the disease.

As to the first heading.—The age at which the British soldier arrives in India is precisely that at which anyone is most liable to the disease. This has been found to be the case everywhere. M. Andral found that young medical students, for instance, were most likely to be attacked with enteric fever within a few days of their arrival in Paris. He forbore, however, to state that there was something in the climate of Paris especially calling forth enteric fever in young recently-arrived medical students.

As to the second heading.—The young soldier on his arrival in India is daily exposed to the chances of meeting with the specific infection of enteric, except during the period that he lives in his barracks, and here even, as I shall show presently, agents of infection can creep in. Doubtless if the soldier never left his barracks there would be much less enteric, but of necessity he cannot be confined there. In his walks abroad he goes to the bazaars or amongst the villages neighbouring to the cantonments. The late Professor Maclean, in alluding to these bazaars, stated that "they stand on soil for ages sodden with excrement." And another authority writes: "There is no station in India, however carefully its sanitary condition may be attended to, where the conditions for faecal contamination of water easily accessible for drinking, though not intended for that purpose, does not exist."

Thus, on the pythogenic theory, there can be no difficulty in accounting for the origin of enteric fever. But at the present day it is held that a specific disease must have a specific cause; so that the presence of the bacillus of Eberth must be premised. Now as regards the natives of India, of late years the evidence has been increasing that they are subject to enteric. Sir William Guyer Hunter, from his experience as

Professor of Medicine at Bombay, states that no race or sect is exempt. Long ago Scriven found it in the natives of Lahore. Deputy-Surgeon-General A. C. de Renzy, C.B., who did so much to further the sanitary condition of the Punjab during his term of office, drew attention to the enteric fever prevailing at the gaol at Rawal Pindi, giving perfect histories and *post-mortem* results. Chevers noted it in Bengal, Brombie in Burmah, O'Brien in Assam. Wright recorded cases in the 6th Bengal Infantry. Dr. Drury, Professor of Pathology at the Medical College, Calcutta, believes it to be more common in the natives of Bengal than is supposed. Freyer, of the R.A.M.C., showed by the Widal test that the majority of natives had had it in their youth; whilst Elliott of Madras finally states that all natives suffer for it at some time or other, and hence that a degree of immunisation is established, rendering the fever atypical.

Now if this be true, what does this mean? It means that owing to the want of sanitation the soil of India must be contaminated continually with the typhoid excreta and bacillus of Eberth. The vitality of the bacillus of Eberth is exceedingly long. Cayley records a case very pertinent in this respect. Typhoid stools were burnt in a dunghill. Some five weeks after, five persons employed in removing dung from the heap were attacked with typhoid; their alvine discharges were buried deeply in the same heap. Nine months after, one of the two men employed in the complete removal of the dung heap was attacked with enteric fever and died.

If we now consider that the soil of India is contaminated by the bacillus of Eberth, how then does the soldier get this organism into his system? Doubtless (1) the liquids he drinks in the bazaars are responsible to a large extent, but in a still greater measure two agencies are culprits; I allude to (2) dust and (3) flies. The enteric fever rate rises in the hot weather; so does the dust storms. Anyone who has experienced one knows how impossible it is to keep the dust out of one's bungalow during a storm. Consequently the dust, bearing the typhoid bacillus, settles on food that may perchance be exposed, and so gains entrance to the system. An example of this occurred definitely in the Soudan in 1885, where it was held that much of the enteric fever was due to the patients' excreta being rapidly dried and then carried hither and thither by the wind. Lastly, as regards its diffusion by flies. We need only consider what happened in the Spanish-American war to understand what happens in India. Camps here were ravaged by enteric in spite of the most elaborate sanitary arrangements. A special commission appointed to inquire into the epidemic reported that it was due to the common house fly. The various camps were infested with millions of flies that carried the poison from the latrines to the food. Even with the purest water supply, whole messes and tents were infected at the same time.

I stated that even in his barracks the young soldier was exposed to the chance of infection. That this is so is evident from the fact that the chance of infection by flies cannot possibly be reduced to a negligible quantity; whilst considering the uncleanly habits of

the native cooks, it would be a miracle if the food were not infected. I need only recall the celebrated instance of an attack of cholera that seized a party of officers some years ago, and which was traced by the logical mind of Professor Hankin to the dirty *jairans* employed by the native servants—*jairans* that infected with the cholera microbe.

Thus, to sum up the subject, it appears to me that it is a matter of marvel that more men are not infected with enteric than is at present the case in India, considering that:—

(1) There is a continual supply year by year of a large body of men most predisposed to the disease. Thus every year a fresh stock of the infective agency is added to the country.

(2) This large body of men most predisposed to the disease, though living nominally in highly sanitary barracks, are yet daily exposed to the infection of enteric contained in—(a) The liquids they imbibe in the bazaars; (b) the dust of the station; (c) the agency of flies.

(3) The country soil is, moreover, becoming yearly more and more impregnated with the enteric bacillus.

Prevention.—What hope have we of counteracting these morbid influences? We cannot stop the men from entering the bazaars; flies can scarcely be prevented from contaminating their food; dust-storms cannot be prevented. It has, indeed, been proposed to lay the dust in cantonments by water-carts. This, however, will go but a short way, for dust is carried by the winds not only from the roads and fields in immediate relation to the barracks, but also from afar off. One remedy is to annihilate the bacillus by burning the stools of the sick, and the most efficient way is to burn them with straw or some other vehicle impregnated with petroleum in incinerators, as recommended by the late Professor Du Chaumont. Especial attention must be paid to the urine, as this is shown by Dr. Horton-Smith to contain the bacillus for a longer time than the motions. It is, however, more important to stop anyone getting enteric than to stop any further extension for a previous patient; and to do this the only remedy would seem to be that of compulsory inoculation. Vaccination for small-pox is compulsory in the army as a prophylactic; and that vaccination has had a beneficial effect can be testified by any medical officer of some years' standing. When I first went to India the majority of recruits were marked with small-pox; when I left, the majority of recruits were not so marked. The statistics hitherto published show that the method of preventive inoculation, so ably advocated by Professor Wright, small in number though they be, has had a well-deserved success. Thus, to briefly enumerate the results gained by this method, they mention:—

In India, 1899: (a) The percentage to strength of cases of typhoid was—amongst the inoculated 0·98 cases, with 0·2 mortality in 4,502 cases; amongst the non-inoculated 2·54 cases, with 0·5 mortality in 25,851 cases. (b) Amongst the 15th Hussars at Meerut—360 inoculated gave 2 admissions, 1 death; 179 non-inoculated gave 11 admissions, 6 deaths; or, in the inoculated 0·55 per cent., mortality 0·27 per cent.; in the non-inoculated 6·14 per cent., mortality 3·35 per cent.

In South Africa, at Ladysmith, in the Princess Christian Hospital, in the Portland Hospital, in the Scottish National Red Cross Hospital, in the Kroonstadt Hospital, the results were all very favourable to inoculation. The only adverse report is one by Dr. Washbourn, of Guy's Hospital.

In Egypt and Cyprus during 1900, amongst the non-inoculated of 2,669 cases the cases of enteric were 2·5 per cent., with a mortality of 0·4 per cent., whilst amongst the inoculated of 720 cases the cases of enteric were 0·14 per cent., with a mortality of 0·14 per cent.

Lastly, during the great epidemic at Maidstone, of 84 nurses and attendants inoculated not one was attacked; whilst of 120 not inoculated 16 were attacked. The evidence in favour of the prophylactic action of inoculation, so far, is incontestible.

Lieutenant-Colonel A. Crombie, I.M.S. (retired), did not believe that typhoid in practice was so common in India amongst natives as amongst Europeans. In some parts and amongst certain people the disease was prevalent, while in other parts it was almost unknown; thus amongst the Ghoorkas typhoid was very common, whereas in Madras and Lower Bengal enteric ulcerations were seldom found *post mortem*. Dr. Crombie mentioned an observation pertinent to the value of Widal reaction. He examined the blood of three natives of Bengal under the age of 30 living in London, and of three of similar race and similarly placed over the age of 40. The blood of the first group of cases gave well marked Widal reaction, although the men appeared in good health, never had they ever been laid up with typhoid nor were they ill at the time of examination. Of the cases over 40 years of age that were examined, no reaction occurred with Widal's test. Dr. Crombie believed that there were fevers which ran a twenty-one days course in India, in which there was no eruption, no diarrhoea, and but occasionally an enlarged spleen, which were not typhoid at all. In South Africa 75 per cent. of the cases returned as typhoid gave Widal's reaction. Concerning the value of Wright's anti-typhoid inoculations he had noted that of 300 cases convalescent from typhoid in South Africa 60 per cent. of the 300 had been inoculated once and 10 per cent. inoculated twice. He knew of one case inoculated a second time with six months' interval between inoculation to have had typhoid two months after the second inoculation, and second attacks of typhoid were not uncommon.

Captain W. R. Battye, I.M.S., stated that with the idea of testing the method of spread of typhoid an experiment had been made in India in which servants were made to rinse their hands in water in a common basin, but although they continued to do so for many days the bacillus of Eberth was not found in the water in the basins. Captain Battye believed that a harmless organism might become pathogenic under certain conditions, such as the presence of decomposing matter would engender.

Lieut.-Colonel J. L. Poynder, I.M.S., said that enteric in India was probably a disease of youth, and that it was possible the men mentioned by Dr. Crombie as being over 40, and giving no Widal reaction, in all probability had had the disease in their youth.

Professor F. M. Sandwith, M.D. (Cairo), held that the anti-typhoid inoculation method of Wright was not yet complete in any way. They scarcely even knew what they were injecting, and the after-effects were very uncertain. Professor Sandwith mentioned that of twelve nurses who went to South Africa three got typhoid, although none of them died. He advocated systematic blood examination when Wright's treatment was being tried.

SOME OPHTHALMIC COMPLICATIONS OF PLAGUE.

By Major F. P. MAYNARD, M.B., F.R.C.S.Eng., I.M.S.,
Civil Surgeon of Patna and Superintendent of the Temple Medical School.

ALL writers on plague describe the injected eyes as characteristic of the plague facies. The plague-stricken, and sometimes half-drunken, look which enables one often to recognise at a glance patients attacked by the disease is in part due to this injection.

Mr. Cantlie, in his article in the *Practitioner* Plague Number, says plague patients sometimes get inflammation in eye and loss of vision from changes probably beginning in the choroid. With this exception I have come across no description of the condition upon which this injection depends, or of the serious results to which it may lead.

During the recent severe epidemic of plague in Patna I came across 12 cases in which there were ophthalmic complications. The notes are briefly recorded below. In all the attacks were severe, 7 had buboes that suppurated, and in the majority there was delirium or insensibility. The lesions met with were not, however, the result of lagophthalmus. They were rather the results of iritis and opacity of media apparently from interference with the nutrition of the eye.

Of the 12 patients examined 6 recovered with one eye sound. In the remaining 18 eyes the following lesions were noted: Cornea—hazy in 4, opaque in 2, and sloughed in 4. Iris—Signs of iritis, varying from a few dots of pigment on the anterior capsule to *occlusio pupillæ*, in 12 cases, and in 3 others the iris was prolapsed. Sclera—Scleral staphyloma was met with twice. In both cases it was ciliary, and in each the dark projection was separated from the corneal margin by a strip of healthy-looking sclera. In one the iris was evidently drawn up into the staphyloma, and its upper portion was not visible through the clear cornea. Lens—was hazy in 7 eyes and quite opaque in 5. The media were hazy in 6. The fundus was normal in 3, showed a hæmorrhage in 1, and the appearance of a limited retinitis pigmentosa in one other. The tension was diminished in 12 cases, normal in the rest. Vision—*Nil* in 5, p. l. only in 8, and fairly good in 5.

The enumeration of these lesions shows the serious nature of the eye complications of plague when they occur. The most remarkable feature in plague *post-mortem* examinations is the extensive extravasation of blood that are met with throughout the body. I was prepared and on the look-out for similar hæmorrhages in the eye. In only one eye was one found. The media are so hazy usually, however, that more examinations of the fundus in various stages of the disease

are required before dismissing this as a possible explanation of the destructive changes met with. The rapid development of scleral ectasias and the usual diminution of tension are rather remarkable. Scleral ectasias usually develop slowly, and oftenest from increased tension. In these eyes the sclerotic must have become less resistant to normal or even reduced pressure.

Treatment was of no avail, because started too late perhaps, in all except one case, where potassium iodide and nux vomica internally, atropine and blisters on the temples, seemed to have a good effect. The tension rose to normal, and the sight improved. It was the good result after treatment in this case that caused several of the others to consult me.

LEPROSY BEING ERADICATED IN THE HAWAIIAN ISLANDS.—According to a recent cable, leprosy is being slowly but none the less certainly eradicated in the Hawaiian Islands. Five years ago there were over 1,300 inmates at the leper settlement on the island of Molokai, but when the annual visit was made a few days ago there were barely 900. This is due, not so much to any scientific treatment of the disease, as to the gradual extinction of the native race, which, alone, in the opinion of Superintendent Reynolds, of the settlement, will cause the complete eradication of leprosy. Last year there were an even 100 lepers sent to the island, while only 50 have been sent during the first nine months of the present year. In the biennial period, ending December, 1900, directly after the islands had been annexed, over 500 were taken to the settlement. This was due, not to any increase in the disease, but to the fact that the question was taken out of the hands of the party previously in control, and many afflicted persons who had remained in Honolulu through political influence were hurriedly bundled off to the place of segregation. The disease is thought to have been brought to the islands thirty years ago by a Chinaman, and as soon as it once reached the natives it spread with great rapidity. The Hawaiians are much given to an outward display of affection, especially kissing and embracing. They smoke the same pipe, eat from the same dish, and in other ways lead to a direct inoculation of the disease. The same reasons are given by the physicians for the great increase in tuberculosis among the natives. Every accommodation is provided for the lepers at Molokai. They have their own homes, a school for boys and one for girls, and seven churches for the little town of 900 people. Besides the lepers there are about 100 persons at the settlement—teachers, ministers, and nurses. Of the 900 lepers on the Island of Molokai, all but fifty are native Hawaiians. There are only fifteen whites and thirty Chinese. Expert physicians who have made a lifelong study of leprosy in Japan, France and China, have been studying the conditions, but have found no suitable remedy for the disease. The local government has given up experiments, and there is a general feeling that the United States should now take up the study with the purpose of effecting a permanent cure.—*New York Medical Journal*, October 12th, 1901.

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THE

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A CANCER ENQUIRY EXPEDITION.

HOW THE ETIOLOGY OF MALIGNANT DISEASE MAY BE ELUCIDATED BY ENQUIRIES AND OBSERVATIONS AMONGST NATIVES OF THE TROPICS.

HAS the time come for a malignant disease enquiry expedition? We have been familiarised lately with "Malarial Expeditions," "Beri-beri Expeditions," "Yellow Fever Expeditions," &c., so that the term "Cancer Expedition," ungainly though it seems, is not quite anomalous or eccentric. Malignant diseases, even allowing that they are not increasing, which is doubtful, are a scourge of sufficient importance to justify enquiries to be made in every direction and by every method at our disposal. Local enquiries in European countries have yielded as yet but few, if any, facts of scientific precision, and we are as much in the

dark as ever concerning cancerous infection. In Great Britain maps of the prevalence of malignant disease conveying much useful information have been published; statistics as to the prevalence of cancer in relation to telluric conditions are interesting; and even we have some imperfect knowledge of malignant diseases as they affect races. Bacteriology has as yet effected nothing practical in connection with the etiology of cancer, and the means of investigation at our disposal seem exhausted. There is, however, another aspect of the disease which lies open to us, namely, a world-wide enquiry as regards the prevalence of the disease. The natives of India, China, and other countries are popularly believed, and to a certain very limited scientific extent are known, to be, if not immune, at least much less liable to become the subjects of cancer than are the people of Western Europe, and of the more temperate countries of Northern America. Is this assumption correct? is a point worth determining. Were the enquiry conducted more widely and still more thoroughly, not only might a great deal of useful information be obtained, but it is possible some facts of practical importance might be ascertained, for in this direction it would seem a possible solution of the cause of cancer lies.

Granted that certain people are liable to cancer whilst others are exempt, surely some sound conclusion could be deduced by a careful study of the facts. Granted, again, that certain people have been known within recent times to have acquired cancerous infection, a great step in determining either the immediate cause or the means by which the disease spreads will have been established. It is arguing from this standpoint that expeditions to determine the cause or mode of spread of such diseases as malaria and beri-beri have been sent out, and if it is hoped to unravel the mysteries of these scourges by such enquiry, the same may be claimed for an expedition concerning cancer. We know that in some islands of the Pacific malarial diseases prevail, whereas in adjacent islands malaria is unknown. Into these subjects enquiry is being made with every hope of determining the initial

factor of the disease. We know also the tubercle bacillus does not thrive in certain countries, nay more, that it is killed by the atmospheric conditions appertaining in these localities.

Every disease would seem to have its home or endemic centre, and there is no disease that affects equally the whole human race. Diseases have their geographical distribution as pronouncedly as have plants and animals. A few examples will suffice. Yellow fever has a distinctly local distribution. Scarlet fever disappears from the category of disease in equatorial regions. Leprosy, on the other hand, increases in frequency as the equator is approached. Cholera has its endemic centre only in tropical and sub-tropical countries, and the same may be said of dysentery, plague, sprue, yaws, &c., &c. Is it true, therefore, that cancer has a geographical distribution? Does it, in contradistinction to leprosy, diminish as the equator is approach, or is its prevalence determined by other factors than by climate merely?

The enquiry is not without difficulty nor yet without pitfalls for the scientific investigator. Natives, generally, are backward in coming to European doctors when suffering from certain diseases. Native women, amongst whom an inquiry concerning malignant ailments must play a prominent part, if it is to be thorough, are especially reticent, the more so if the disease they suffer from is likely to require surgical treatment. Every practitioner in the tropics must know how, whilst living in the midst of natives, he or she (for even lady doctors are not always taken into women's confidence) may form an erroneous impression concerning the prevalence of certain ailments. The writer had confirmatory experience of the kind whilst practising in Hong Kong. For five years after taking up residence there the writer saw no case of ovarian tumour. A woman, however, came for advice for a very advanced tumour of this nature. She was successfully operated upon, with the result that many cases of a similar nature, within the next twelve months, came under notice. The number kept increasing until a death after operation occurred, when no more patients suffering from

this ailment were met with. Had the writer formed his conclusions concerning the prevalence of ovarian tumours amongst the women of Southern China from a five years' experience, a period seemingly entitling him so to do, a false and misleading statement would have been the result. The same experience in a more limited degree befell the writer in regard to malignant disease. It was only after several years' residence in a warm climate, that malignant disease of the breast was seen in a native, or to be more exact, in a half-caste woman (British and Chinese). The last remark is especially interesting and noteworthy, namely, that the patient suffering from cancer was a half-caste; it may have been due to her partly European origin that he became infected.

Enquiry into the subject of malignant disease amongst natives of warm climates is not without difficulty, but were an expedition sent out from this country fully equipped, and conducted with tact and judgment, there can be no doubt a great deal of knowledge concerning cancer would be obtained. By collating such information a basis of study might be established, by following which some scientific precision might be given to the manner of investigating malignant diseases, which at present is for the most part purely empiric.

J. C.

LIVERPOOL SCHOOL OF TROPICAL MEDICINE.

AN important development has lately taken place in connection with the Liverpool School of Tropical Medicine, consisting in the establishment of a hall of residence for the use of students attached to it. It consists of commodious and well-furnished premises in Upper Parliament Street, a situation convenient for the Southern Hospital and for the Medical School, being on one of the principal tramway routes. The new hall was formally opened by the Lord Bishop of Liverpool on November 2nd, in the presence of a large gathering of citizens, representative of the philanthropy, commerce and medicine of the city.

Sir ALFRED L. JONES, K.C.M.G., remarked that the idea of the hall of residence was conceived by certain gentlemen who thought that the Liverpool University might give some world-wide help by bringing over young men from the various Colonies, and giving them cheap means of University education, with a view to their returning home either as qualified

medical men or otherwise, to the great advantage of the natives. The time had arrived when commerce and science might be treated as economic as regards these countries and it was with that object that that hall, which they hoped by and by would be able to accommodate 200 students, had been established. It was hoped that the Colonies would put forward a number of youths, and that the shipping companies would give them free passages, so that the scheme of assisted education in Liverpool might be successful. They had to tender their thanks to Professor Boyce and particularly to Mrs. Boyce, for their labour in connection with that admirable home, which he was sure would be a great blessing to the students. He believed that the movement would be of great value to the world, and he hoped that that day would be a historic one in the development of the tropics.

The BISHOP, in declaring the hall open, said that that new department would be watched with great interest from many parts of the world, and would, he thought, be fraught with great results. That home was the child of the Liverpool School of Tropical Medicine, which, although itself an infant, had already made its mark in the world, had its martyr in Dr. Myers, and had recorded a great triumph in the work of Major Ross in West Africa.

The school sought to minimise the danger to European lives in West Africa, and the result would be that a large number of students would sooner or later be flocking to Liverpool from all parts of the world, for here, thanks to the existence of University College, they would have special advantages for the study, not only of medicine, but also of architecture, engineering, and many other things. A wise statesmanlike and true Christian spirit had led to the foundation of that hall. First of all it was a home for strangers in a strange country, where they would be cared for without being coddled, and sheltered without being put in straight-waistcoats. They would be under a trained warder, who would be an elder brother, counsellor and friend, to those living with him, to help and advise them as regards their studies, and help to form character, which after all, was the greatest wealth the nation or Empire could have.

It was also catholic. It made no distinction of nationality or colour of men's skin. Already he had been introduced to two residents, both of whom were Africans, and he believed that one of the promoters, the Hon. R. B. Blaize, of Lagos, was himself a native. Lastly, he could not help noticing that the home was wonderfully economical, because students were asked to pay only £1 a week, inclusive of three square meals a day. They all owed a great debt to the three kindly-hearted men who had enabled the hall to be opened free of debt, namely Mr. (now Sir), A. L. Jones, Mr. John Holt, and the Hon. R. B. Blaize.

Principal DALE, in moving a vote of thanks to the Bishop to the three gentlemen just named, and to the Warden (Dr. Annett), spoke strongly as to the value of such a home to students brought from abroad into the midst of a great city with its dangers and temptations.

Sir A. L. JONES spoke of the continued progress of the school, which, he said, was now spending £5,000 a year.

News and Notes.

ON THE PRINCIPAL AILMENTS OBSERVED IN THE BRITISH ARMY DURING THE SOUTH AFRICAN WAR.—The published statistics on the various ailments met with in the British Army were as follows:—

There were 28,531 medical cases apportioned under the following headings: 5,462 typhoid fever; 2,963 rheumatism; 2,568 malaria; 1,872 continuous fever (simple); 1,527 diarrhoea; 986 jaundice; 719 influenza; 710 tonsillitis; 435 bronchitis; 22 rheumatic fever; 3,412 fatigue.

It will be observed that sun-stroke, in spite of the intense heat prevalent, does not enter into this list of ailments. The absence of sun-stroke during this campaign furthers the belief advocated by Dr. Sambon and others, that heat alone is not the determining factor in sunstroke (siras).

SIR ALFRED LEWIS JONES, K.C.M.G.—All who are interested in the Liverpool School of Tropical Medicine are much gratified to learn that its founder, Mr. Alfred L. Jones, has been created a Knight Commander of the Order of St. Michael and St. George. We congratulate Sir Alfred upon the well deserved honour.

Current Literature.

PERNICIOUS ANÆMIA.

FOUSTANOS OF SYRA, in a paper read at the Medical Congress held in Athens during May, 1901, attributes the condition of the blood in pernicious anæmia to a toxic substance formed in the digestive tube or in the blood itself. The toxin, according to Foustanos, is produced in the hæmatopoietic organs, the liver and spleen, and the entrance of the toxin into the blood is the cause of the wholesale destruction of the red corpuscles.—*L'Egypte Médicale*, 1901.

In this matter we would refer M. Foustanos to the recent writings of Dr. William Hunter, of London, who goes a step further and proves by pathological specimens that pernicious anæmia is associated with, or dependent upon, an intestinal lesion of marked characteristic.

BERI-BERI.

BERI-BERI IN THE JAPANESE ARMY.—The Director-General of the Medical Department of the Japanese Navy, Baron Saneyoski, publishes in the *Sei I. Kwai Medical Journal*, for April and May, 1901, statistics concerning the prevalence of beri-beri (kak ke) in the Japanese Army, between the years 1884-1885. The report is interesting, because it was during the years in question that beri-beri broke out in the Japanese Navy; but until the present information was made public we had no knowledge that the disease prevailed in the Army as well as in the Navy of Japan.

The principal conclusions arrived at by the Baron Saneyoski are—

(1) That in the East rice-eaters are the only persons affected by beri-beri.

(2) The improvement in diet in the Japanese Navy and Army since 1884 has extirpated the disease.

(3) That no other hygienic improvement has been recognised as having anything to do with this result.

(4) Rice-eaters transport beri-beri to places where no beri-beri had existed before their arrival.

(5) Beri-beri and rice are inseparably connected; lack of nutritive substance is the cause of beri-beri. In the Japanese Army, and in the prisons, the introduction of barley into the diet, along with rice, caused a speedy diminution of beri-beri.

Beri-beri is more apt to occur amongst communities who are supplied with "white Chinese rice," than amongst those who consume "red Chinese rice." It appears, in support of the diet theory of causation, that the "red rice" yields, on analysis, a larger quantity of fat and albumin.

DYSENTERY.

At the meeting of the New York County Medical Society, Dr. Simon Flexner of Philadelphia spoke briefly upon the subject of The Etiology of Acute Dysentery. He said that reports of bacteriological work in the tropics, Japan, Germany, and in this country upon the etiology of acute dysentery agree that there is present a septic organism, quite peculiar and not found in the body under normal conditions, which seems to be present uniformly when cases of acute dysentery arise. It would appear that the sporadic cases have the same origin as the acute dysentery, which is of particular importance in the consideration of epidemics. The micro-organism that has been discovered is that bearing more or less resemblance to the bacillus of typhoid fever. It occurs in the intestines and can be obtained from the dejecta. It does not occur in health or in other diseases. Moreover, the blood serum will give a reaction similar to the Widal reaction. Dr. Flexner thinks it probable that, as a result of this work, the septic organism of acute dysentery has been observed. It is possible by the use of this organism to produce serum which may be curative.

ETIOLOGY OF TROPICAL DYSENTERY.—Flexner (*Johns Hopkins Hosp. Bull.*, Baltimore) gives an account of his researches, carried out at Manilla, at the instigation of the Johns Hopkins University. Two main types of the disease were met with, acute and chronic, each with its distinct pathological appearances. In the acute variety, amœbæ were either absent, or in very small numbers, while in the chronic form they were more numerous and constantly present. In all the acute cases, in addition to the cocci and bacilli usually found in acute enteric conditions, he found bacilli of two types. Type 1 was identical with *bacillus dysentericæ*, described by Shiga of Tokio; and type 2 nearly allied to *B. coli communis*. The organism described as type 1 was the predominating organism in all acute cases, while type 2 occurred in small numbers in all cases. Details are given of the appearances, cultural characters, and pathogenesis of these organisms. Shiga's *B. dysentericæ* differs from *B. typhosus* in (a) being less mobile, (b) displaying

more uniform production of indol, (c) after slight acid production it gives rise to increasing alkalisation, (d) it is inactive to blood serum from typhoid cases, but reacts with serum from dysenteric cases, to which *B. typhosus* does not respond. He thinks that his results tend to confirm the *B. dysentericæ* as the specific cause of acute dysentery, and open up the way for attempting a method of artificially immunising persons exposed to this very fatal disease.—*Ind. Med. Record*, October 16th, 1901.

FURUNCLES.

THE TREATMENT OF FURUNCLES.—According to the *New York State Journal of Medicine* for April, Philipson recommends salicylic acid, in 50 per cent. strength, in the treatment of well-formed furuncles. The following paste is applicable for such conditions:—

R Salicylic acid 1 oz.
Powdered starch 1 drgm.
Lanoline 1 oz.

M. Sig.: Apply locally and change three or four times a day, in order to hasten the necrotic process.

When the core has been eliminated, he advises treatment to favour granulations. Minute furuncles may be checked by applying the following:—

R Tincture of benzoin 1 drgm.
Alcohol, enough to make 3 ozs.

M. Sig.: Apply locally three times a day.

In generalised furunculosis the parts should receive a warm bath daily and then be rubbed with the following:—

R Salicylic acid 25 grs.
Vaseline, enough to make 2 ozs.

M. Sig.: To be well rubbed in over the affected area.

LEPROSY.

THE CONTAGION OF LEPROSY.—The newspapers publish a despatch from Copenhagen stating that City Physician Feilberg, of that place, who recently visited the West Indies, is suffering from a marked case of anæsthetic leprosy, which he is believed to have contracted from a patient whom he attended while in the West Indies.—*Medical Record*, October 26th, 1901.

LEPROSY IN HAWAII.—According to a recent report of the Marine Hospital authorities in Hawaii there are now 909 lepers and 164 healthy persons in the leper settlement of Molokai. The cost of the settlement, including the housing, feeding, and clothing of these persons, is about 80,000 dols. per annum. The three oldest patients at the settlement arrived in 1874, 1875, and 1879 respectively. The number of commitments to the settlements each year during the last decade, ranging from 132 in 1891 to 85 in 1900, show a gradual decrease, despite the fact that the hunt for lepers throughout the islands has never before been so vigorous.—*Medical Record*, October 26th, 1901.

IS LEPROSY CONTAGIOUS?—Dom Santon states that the careful and impartial study of this subject shows that leprosy is contagious; this power of contagion is not often exercised; hygiene and cleanliness render it almost nil; occlusive dressings, aseptis, antiseptis, and disinfection are sure means of protection. The question of danger of contagion is much more simple than one would think. According to Hansen, "in

order that leprosy be communicated, there must, without doubt, be much uncleanness." However, the observance of the conditions mentioned above will effectively prevent the contagion.—*La Press Médicale*, June 15th, 1901.

MALARIA.

A CASE OF MALARIAL REMITTENT FEVER TREATED WITH LARGE DOSES OF ARSENIC. — C. J. Gremillion reports a case of malarial remittent fever in a woman who exhibited a marked idiosyncrasy to quinine, that drug producing severe pain in the stomach, cramps in the legs, cold, clammy perspiration, and rapid, laboured respiration. She received five drops of Fowler's solution for three days every four hours, then every hour for two days, then every two hours for twelve hours, and afterwards ten drops three times a day. She made an uneventful recovery. The case is interesting because of the idiosyncrasy to quinine, and on account of the quantity of arsenic taken without symptoms of poisoning.—*New Orleans Medical and Surgical Journal*.

NOTIFICATION OF MALARIA.—At a meeting of the Board of Health, held in New York August 30th, 1901, a set of resolutions was adopted to the following effect: (1) That all public institutions, hospitals, homes, asylums, &c., be required to report all cases of malarial fever which come under observation, giving the name, age, sex, occupation and present address of the patient, and also information as to whether the attack is a primary infection or a relapse, and the address where the disease was probably contracted; (2) that all physicians in the city be requested to furnish similar information in regard to patients suffering from malarial fever under their care; (3) that the circulars of information of the Department of Health regarding "the causation and prevention of malarial fever" be mailed to the addresses in which malarial infection has apparently been contracted, and also to the addresses from which the cases are reported, when these are different; (4) that postal cards for furnishing the required data be prepared and forwarded to institutions and physicians for reporting the cases of malarial fever which come under their observation, as is done in other infectious diseases.—*Boston Med. and Surg. Journal*, September 5th, 1901.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Médecine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletín de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Caducée.
Climate.
Clinical Journal.

Clinical Review.
Giornale Medico del R. Esercito.
Hong Kong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
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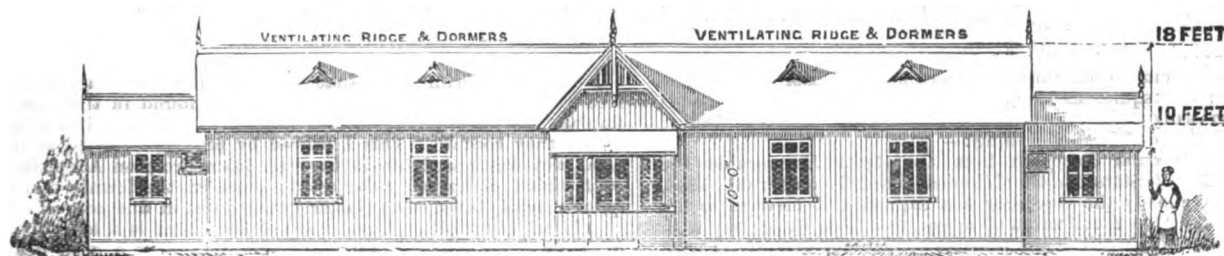
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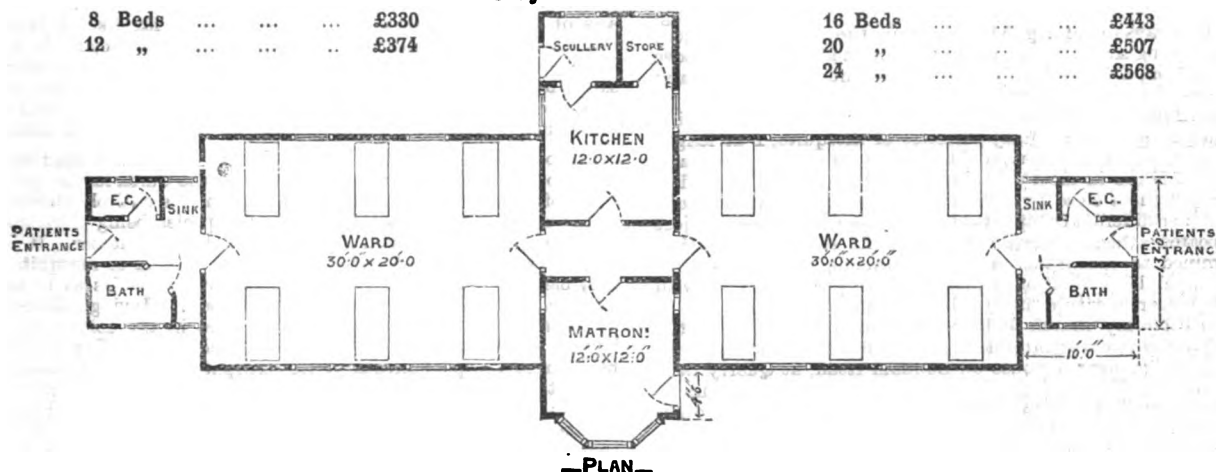


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The Malarial Mosquito in Hongkong.

FROM THE

"CHINA OVERLAND TRADE REPORT."

The accompanying notes concerning the existence of the Malarial mosquito in Hongkong were read by Mr. C. V. Ladds at a meeting of the South China Branch of the British Medical Association on Monday evening:—

In a Circular Despatch from the Right Honourable the Secretary of State for the Colonies, dated December 6th, 1898, His Excellency the Governor was requested to forward to the Colonial Office a collection of mosquitoes from the colony with a view to investigating the possible connection of Malaria with this genus of insect.

Two collections were forwarded as requested upon August 18th and November 21st respectively, and none of the species *Anopheles* having been included in these collections it was thought at that time that they did not exist in Hongkong. Having always taken a great interest in the Malaria question, and not being satisfied with the result obtained during the above investigation, I determined to take up the subject privately, and commenced work in December, 1899.

After going thoroughly into the matter, and after having cultivated the larvæ of many varieties of mosquito, I at length found that the *Anopheles* undoubtedly did exist in the colony and was to be found in most of its known malarial districts. I first discovered them close by a Government bungalow at Kennedy Town. The different occupants of this house having been subject to repeated attacks of fever ever since its erection in 1895, I determined to make this place my starting point, and after a very careful examination, I found a small pool swarming with *Anopheles* larvæ within fifty yards of the building.

Extending my search I found the same species near the Kennedy Town Fever Hospital, at Magazine Gap, at Wong-nei-cheong village, near a house on Bonham Road, at Quarry Bay, close by the Taikoo Sugar Refinery, all round the camp of the Welsh Fusilier detachment at Kowloon, and in many other places.

This being sufficient evidence of their existence over a considerable area of the colony, and having now no doubt that they were to be found in all the malarial districts, I next proceeded to examine the particular kind of pool which the *Anopheles* appeared to select as most suitable for the propagation of its species.

A small shallow pool containing algæ, or green flocculent water-weed, and fungoid growths, abounding in all kinds of aquatic insect life, and which is not quite stagnant (or if stagnant at the time of discovery is not likely long to remain so, but is renewed occasionally by small flushes of rain water), appears to be their favourite *habitat*.

In nearly every instance I found them only in such pools, which were in most cases fed by minute streams issuing from small springs in the hill side, and these not being of sufficient volume to scour out a channel of their own, just spread themselves over the surrounding lower ground, and so help to form and feed the typical *Anopheles* pool.

They do not seem to inhabit pools which are entirely stagnant (or likely to remain so long) or which contain no water-weed; and appear to be particularly careful in their selection, as, although there may be dozens of pools in the locality, only a few of them may contain *Anopheles*.

Having repeatedly found the mosquito hovering round a pool which contained the same species of larvæ, it is probable that the adult insect returns to its original home to deposit its eggs, and this theory may, if correct, account in a measure for their not being found scattered indiscriminately about everywhere. After once seeing the particular kind of pool which these mosquitoes affect it is easily recognised, but it is not quite so easy to describe it correctly; yet I trust that I have given a fair general idea of what to look for.

I find by experimenting that the *Anopheles* larvæ appear to feed upon the algæ or water-weed which is found in their particular pools, and also possibly upon some of the animalculæ which they contain. This I proved by placing some larvæ in clear tap water and others in water taken from an *Anopheles* pool which contained water-weed; those in the former dying quickly, while those in the latter hatched out in due course. I should not say that the larval stage of the insect is a long one, probably about a week to ten days, this depending a good deal upon the nature of the pool; after which time they emerge therefrom as adult mosquitoes. The life of the mosquito itself probably extends over a period of several weeks, perhaps longer.

I have so far not succeeded in finding the *Anopheles* larvæ in any of the healthy districts of the colony, or far distant from human habitations, nor have I yet found them in rice fields, in large pools of water, in rapidly running streams, in pools with sandy bottoms, in wells, old broken pottery, tubs, pans, &c., as in the case of *Culex*, which may be found in almost anything which contains water.

In contradistinction to the *Anopheles*, water-weed does not seem to be necessary to the existence of the *Culex* larvæ, they being often found in pools, &c., from which it is entirely absent. A further distinction between the two species being that the former appears to be much more delicate than the latter. It is not necessary here to describe the *Anopheles* larva or mosquito, they being so entirely different from the other species as to be easily recognised after having been once seen. Having satisfied myself as to the existence of the *Anopheles* in the colony, and having given a brief description of its *habitat*, &c., I will now pass on to the possibilities of its extirpation from the island. With this object in view, I have been testing the effects of various insecticides. I found that kerosene used as described by the African Commission was very effective in still pools, or in those which were temporarily stagnant; gas tar also proved to be very useful, but in my opinion **Jeyes' Fluid** is the best of those which I have tried up to the present.

So far as my experiments have gone, I find that one part of **Jeyes' Fluid** to 10,000 of water kills both *Anopheles* and *Culex* larvæ in a few hours, very much weaker solutions destroying them after a longer interval.

Permanganate of potash appears to be of very little use. In a solution of 1 to 1,200 of water, equal to one in five of Condry's Fluid, the larvæ lived for twenty-four hours, and were as lively as ever at the end of that time, while in a solution of 1 to 500, equal to nearly one in two of Condry's Fluid, they lived for four hours without there being any appreciable effect upon them, and even after twenty-four hours more than half of them were alive.

Hence by treating all *Anopheles* resorts frequently with **Jeyes' Fluid**, kerosene, or gas tar, during the whole of the dry season, when such pools are comparatively scarce, and by paying particular attention to surface drainage in malarial districts, much might be done towards effecting their partial, if not total, extermination.

In conclusion, I think I may safely say that by working upon these lines, and given the services of half-a-dozen intelligent coolies, some one to look after them, and the necessary supplies of the above-mentioned chemicals, in a very short time it would be possible to cause the *Anopheles* to become so scarce in Hongkong that should they prove to be the *only* source of infection by malaria, cases of malarial fever would soon be as rare as cholera, and the finding of the *Anopheles* larvæ in any part of the island as difficult a matter as looking for the proverbial needle in a truss of hay.

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HYDROBROMATE	76·6 %	" 45 "	·96
*BIHYDROBROMATE	60·0 %	" 7 "	1·23
BISULPHATE	59·1 %	" 11 "	1·24
PHOSPHATE	72·8 %	" 78 "	1·01
VALERIANATE	75·7 %	" 110 "	·97
*LACTATE	78·2 %	" 10 "	·94
SALICYLATE	70·1 %	" 225 "	1·05
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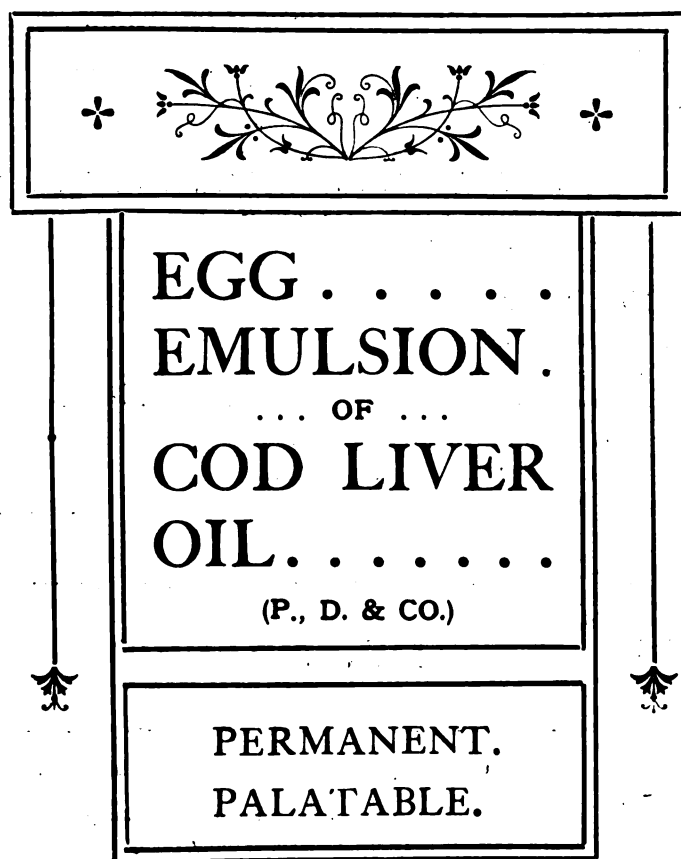
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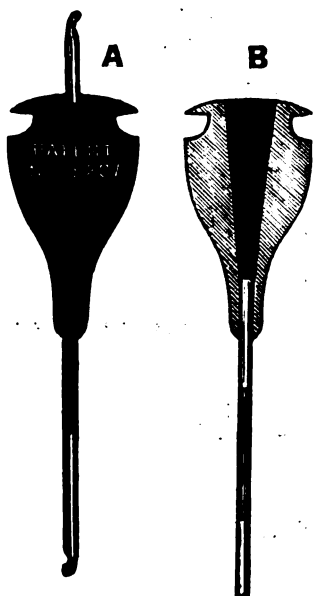
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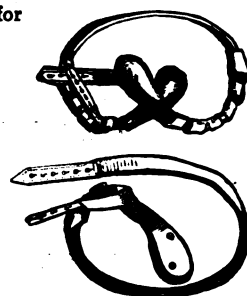
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The Journal of Tropical Medicine.

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Original Communications.

I.—ON A CASE OF FIBROMATA OF THE SCALP.

By J. H. HUGH HARRISON, M.R.C.S.

Assistant Colonial Surgeon, Public Hospital, Belize, British Honduras.

N. M., girl, aged 16, applied at the hospital for treatment. She was a native of the Mosquito coast, fully developed and in good health. She had had

size from a small cauliflower to a marble and occupied a base about four and a half inches in length and four in width, about an inch and a half from the base of the nose obliquely across the forehead and head. The feel of the tumours was softish in some parts and hard in others; they were of a purplish-brown colour with irregular surfaces and of a shiny appearance. The weight made the tumours hang forwards and in order to obviate the pressure the patient used a pad of soft tissue paper on the bridge of the nose.

I operated and removed the entire mass; there was



Before operation.



After operation.

these tumours for the past two years; they had commenced as round lumps, increasing rapidly in size and taking irregular shapes as they grew.

The tumours numbered over eleven and varied in

considerable hæmorrhage, so much so as to alarm one, but which soon stopped on application of pressure and proper styptics. No measures were taken or attempted to bring the edges of the skin together, but

the wound left to granulate. Later on, skin grafting was done successfully. On making sections for examination under the microscope the tumours were found to be entirely fibrous, in spite of feel and appearance as mentioned above.

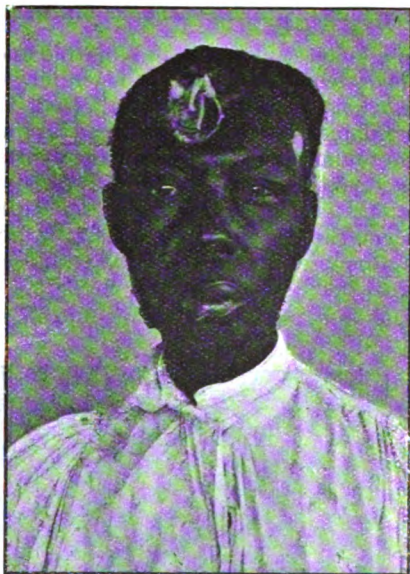
The mass of tumours weighed over four pounds four ounces.

Attached are photographs of tumours before and after the operation.

II.—TROPICAL SLOUGHING PHAGADENA; NECROSIS OF FRONTAL BONE; DESTRUCTION OF FRONTAL LOBES OF BRAIN; RECOVERY.

M. N., a negress, aged 52, was admitted into the Belize Hospital on October 20th, 1899. Her previous mode of living had been such as to encourage a scorbutic taint.

Two months previously she had been bitten by a fly on the forehead; the spot became tender and swollen, and a bleb formed. She let out the serum



with a pin on the fourth day, an ulcer then formed and gradually spread. In the meantime there was much pain, headache and fever, and the discharge from the ulcer became very offensive.

On admission she was emaciated and anæmic, and the stench from the ulcer on the forehead was unbearable. The ulcer was somewhat oval in shape and measured four inches by five inches, occupying the whole of the forehead; the base of the ulcer was formed by the frontal bone, which was necrosed.

The bone being movable, I removed it with the aid of a pair of forceps. A considerable quantity of greenish, highly offensive pus was thus released. The bone removed proved to be the whole of the frontal bone from the superciliary ridges upwards, and it was perforated in places. After cleaning the cavity, it was found that the major part of the frontal lobes had been destroyed by suppuration. The patient made a good recovery and was discharged after being 102 days in hospital.

The case is interesting as but another example of how extensive lesions to the frontal lobe of the brain may result in recovery. It is interesting also as showing how a very small amount of external injury (in this case the bite of a fly) may, in a debilitated scorbutic subject, produce "tropical sloughing phagadena;" and lead to destruction of bone and of tissues subjacent to the bone.

British Medical Association.

(Continued from p. 383.)

MALADIES OF EUROPEAN CHILDREN IN HOT CLIMATES.

By Lieutenant-Colonel A. CROMBIE, I.M.S., M.D. (retired).

SPEAKING generally, it may be said that the sick-rate of European children is lower in India than it is in the United Kingdom. In saying this I refer particularly to the children of civilians, amongst whom my experience exclusively lay. I have no statistics with which to confirm this estimate, but I am confident that the returns of such an institution as the European Orphan Asylum at Calcutta would bear me out. I am the more confident in making this statement because I find that the returns of the Army Medical Department with regard to the children of European soldiers in India, who cannot be so uniformly well cared for as those of the comparatively well-to-do civil European population, show hardly any increase over British rates. Thus in 1899 the sick-rate of 5,500 soldiers' children in India was 527.1 per 1,000, while in the United Kingdom it was 507.3. This was an average non-epidemic year, and may be taken as fairly representing the effect of normal conditions on the admission-rates of children in the two countries.

When we come to speak, however, of the death-rate the matter takes an altogether different complexion. The death-rate of soldiers' children in the United Kingdom is 18.31, while in India it is 41.09 per 1,000. It is obvious, therefore, that the illnesses of European children are more frequently fatal in India than are those of children at home, and it behoves us to inquire in what diseases and in what way these fatal illnesses occur. For the purposes of this inquiry I have drawn up the above comparative statements, in which the relative admission and death-rates of the more important diseases to which children are particularly liable may be compared and contrasted in these different circumstances.

This table is a very instructive one, and brings into prominence the following interesting facts with regard to the diseases common to both countries, namely, that when you deduct from the 2,899 admissions among the 5,500 European children in India the 535 cases of malarial fever which is not common in both countries, the admission-rate in India is reduced to 429.8 per 1,000, or just about 100 per 1,000 less than it is in the United Kingdom; so that if you could defend these children from being bitten by the *Anopheles* mosquito, their chances of illness would be

10 per cent. better in India than in this country. It is a question largely of mosquito curtains, and is one to a great extent within the control of those responsible for the care and management of children in India. It is to this care, to a great degree, that the comparatively good health of the children of the well-to-do civil population is probably largely due.

TABLE SHOWING THE SICK RATES AND DEATH RATES PER 1,000, AS WELL AS THE CASE MORTALITY OF THE PRINCIPAL DISEASES AFFECTING CHILDREN IN INDIA AND THE UNITED KINGDOM IN 1899.

	ADMISSION-RATE				DEATH-RATE				CASE-MORTALITY PER CENT.	
	United Kingdom	India	United Kingdom	India	United Kingdom	India	United Kingdom	India	United Kingdom	India
Eruptive fevers	94.9	68.9	26.0	..	1.27	1.82	..	0.55	1.3	2.7
Malarial ..	1.7	97.3	..	95.6	..	2.18	..	2.18	..	2.2
Other ..	4.2	18.0	..	14.8	..	0.55	..	0.55	..	3.0
Tuberculosis..	2.3	3.1	..	0.8	0.98	0.73	0.25	..	43.2	23.5
Debility, &c...	18.0	38.4	..	20.4	0.98	2.36	..	1.38	5.4	6.1
Other general diseases ..	27.3	17.8	10.5	..	1.73	3.45	..	1.72	6.3	19.3
Diseases of nervous system	9.3	10.0	..	0.7	2.80	5.82	..	3.02	30.4	58.2
Respiratory ..	134.9	68.0	66.9	..	4.46	6.91	..	2.45	3.3	10.2
Digestive ..	103.5	96.2	7.3	..	3.71	13.09	..	9.38	3.5	13.4
All diseases ..	507.3	527.1	..	19.8	18.31	41.09	..	22.78	3.6	7.8

But even including the great class of malarial fevers which, in the comparison, are shown to be almost exclusively present in the Indian statistics, and cause 97 admissions per 1,000 of the children borne on the strength of the European army in India, the admission-rate for children in India is only 19.8 per 1,000 in excess of that of the United Kingdom; and consequently, apart from malaria, it is clear that the same class of children suffer more frequently from illness at home than their brothers and sisters brought up in India. This is in accordance with common experience, so that up to a certain age Europeans do not hesitate to keep their children in India.

From this table it is evident that, apart from malaria, the higher admission-rate in this country is due chiefly to two classes of diseases—namely, the eruptive fevers and diseases of the respiratory apparatus.

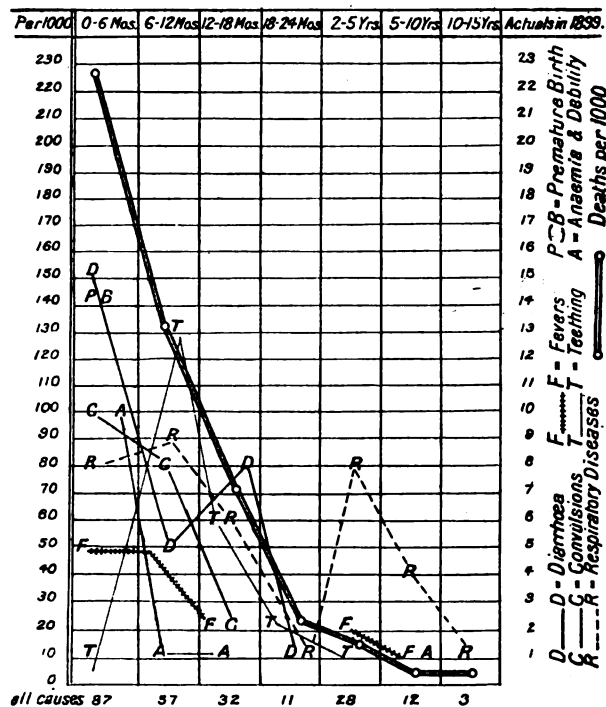
ERUPTIVE FEVERS.

In the case of the eruptive fevers the difference amounts to 26 per 1,000. Of these exanthems, measles was almost as prevalent in 1899 in India as in the United Kingdom (60 against 63 per 1,000) but was relatively more fatal, with a case-mortality of 2.4 per cent. against 0.9. The idea that measles is a milder disease in India than at home is not therefore supported by these figures. Rubella was more prevalent at home in the proportion of 5.6 to 3.6 per 1,000, and scarlet fever in that of 14 to 2.3; and in this respect 1899 was an exceptional year in India, where usually scarlet fever is a rare occurrence. Chicken-pox was also more prevalent at home.

RESPIRATORY DISEASES.

It is in diseases of the chest, however, that Indian children have the greatest advantage. These diseases are just twice as frequent at home as in India. At home bronchial affections gave 126.2 admissions per 1,000, and in India only 58.2. In India, however, the case-mortality was 5 per cent., against 2 per cent. at home. In India both the admission-rate and case-mortality of pneumonia were higher than at home, the figures being 4.9 per 1,000 and 44.4 per cent., against 3.8 and 32.9 at home respectively. This appalling mortality of pneumonia in children in India, amounting to nearly one-half of the cases, bears out what I have long held—namely, that pneumonia is by far the most formidable disease, next to cholera, which we have to treat in India, not only in children, but also in natives. Among European adults the case-mortality from pneumonia is about 12 to 14 per cent. both at home and in India. I firmly believe that a great part of the death-rate in India attributed to fever is, in fact, due to pneumonia in respect of the native population, with whom every illness accompanied by fever is "bokhar," and is returned as such. This is an observation which I have verified many times, not only clinically, but on the *post-mortem* table.

DEATHS per 1000 according to AGE, 1899



DIGESTIVE SYSTEM.

It comes somewhat as a surprise to find that the generally-expressed opinion that whereas the brunt of disease is borne by the chest in cold climates, it falls on the digestive organs in the tropics, is not true, comparatively speaking. As a matter of fact, at least among soldiers and their children, diseases of the digestive system are rather more prevalent at home than in India. At home in 1898 they caused the

admission of 114 men per 1,000, and in India 110 per 1,000, and as regards children they caused 103·5 admissions at home, and only 96·2 in India in the same year, which was in no way an exceptional one.

It is not of their frequency but of their gravity that the received opinion is true, the case-mortality from these diseases being just four times greater in India than at home among children, and nearly six times greater among adults. (N.B.—The diseases I am now speaking of are exclusive of dysentery and cholera.)

DIARRHŒA.

Analysing these diseases of the digestive system we find that diarrhœa gave 39 per 1,000 admissions among children in India and 35 at home, but the case-mortality was 13·5 per cent. in India and only 4·2 at home. Diseases of the mouth and throat caused 35·2 admissions per 1,000 at home and only 14·5 in India. Dentition caused 22 admissions in India against 6·7 at home, and the case-mortality was 12·2 per cent. in India and 5 per cent. at home. Enteritis caused twice as many admissions in India and the case-mortality was double. From these figures it is clear, however, that, excluding diseases of the mouth and throat, which are more prevalent at home than in India, diseases of the stomach and bowels are not only, on the whole, more frequent, but they are, at the same time, nearly four times more fatal in India than at home.

DYSENTERY.

If among these diseases we include the sickness and mortality due to dysentery we find that the admission-rate for that disease was 13 per 1,000 in India against 0·3 in the United Kingdom, and the death-rate 1·27 per 1,000 in India against *nil*. The case-mortality from dysentery in India is 9·8 per cent. among children.

I may here say that the question of the diagnosis of dysentery is not the simple one which it is generally supposed to be, and it is one which would well repay careful inquiry on a scientific basis. The classical symptoms, the tormina, the tenesmus, the bloody mucus in the stools, are not sufficient to warrant the diagnosis of dysentery. In nine cases out of ten in which these symptoms occur they are not caused by true dysentery, but by a rectal catarrh or proctitis of a very transient character, which will subside rapidly if you put the patient in bed, and a poultice on his abdomen, and put him on peptonised milk and a little Dover's powder.

These are the cases which made the name and fame of ipecacuanha, as they are now making the name and fame of the saline treatment of dysentery. I observed and recorded a great many cases of this kind of so-called dysentery, and my record has never been beaten; I think it was, on an average, recovery in two and a-half days. Ipecacuanha does the same in three days, and the saline treatment, I believe, in about the same time; but it is not dysentery, and it can be cured without either ipecacuanha or salines, especially in children.

LIVER ABSCESS.

It is natural to pass from the consideration of dysentery to that of hepatic abscess, and the point

which strikes us, as it has struck every one who has given any thought to the subject, is the entire absence of the mention of the latter disease among those of children in India. In the year 1899, while there were 153 cases of liver abscess among the European soldiers in India with 85 deaths, there was not one among the children. The connection between certain forms of dysentery and abscess of the liver is well established and is not to be denied, and the only explanation of the immunity of children from hepatic abscess is that the kind of dysentery they suffer from is not that which is so frequently followed by liver abscess in adults. It is true that dysentery is just twice as common among European soldiers in India as it is among their children (25·4 to 12·9 per 1,000), but that does not account for the immunity of children, especially as the severity of the disease is much greater in children than adults, the case mortality being 9·8 per cent. among children and only 2·4 among adults. I never in the course of my six-and-twenty years of service in India diagnosed or heard of an abscess in the liver of a child.

OTHER GENERAL DISEASES.

The only other group of diseases in which the admission-rate is higher at home than in India is that of "other general diseases." The principal diseases included under this head are whooping-cough, mumps, anæmia, and immaturity at birth. They do not seem to call for special remark here, except that there are included among them in India five cases of rickets, with two deaths. I do not know whether those among you with Indian experience will agree with me when I say that rickets is much less frequently met with in India than in this country, and more especially among native children in normal years. Those who have had to do with the famines of recent years will probably have a very different experience to relate; but, speaking of normal conditions, I do not think that the out patient departments of Indian hospitals are filled with rickety children as they are, say, in London, where it is probably no exaggeration to say that 20 per cent. of the children seeking relief are more or less the subjects of this disease. But while the admission-rate for these diseases is lower, the death-rate is just double, and the case-mortality three times greater in India than at home.

With regard to rickets, the habit of nursing their children may account for its comparative infrequency among natives, and the absence of destitution and absolute privation among Europeans may do the same for them.

FEBRICULA AND SIMPLE CONTINUED FEVER.

Turning to diseases which are more frequent among European children in India than at home, after malarial fevers already mentioned, we come first to fevers other than the eruptive, and under this head we have to deal almost exclusively with febricula and simple continued fever. The sickness recorded under this head varies greatly from year to year. Thus, while it was 18·0 per 1,000 in 1899, it was 32·4 in 1898. The case-mortality was, however, the same in both years—namely, 3 per cent. We may say at

once that this mortality took place entirely among the cases of simple continued fever, for febricula is not a fatal disease; and this raises the question as to the essential nature of simple continued fever. It is a name given to continued fever of a good many days' duration, which may extend to twenty-one days, but which does not present the usual clinical features of enteric fever, and on this ground practitioners have hitherto hesitated to give it this graver name, especially as in the majority of such cases the duration of the fever does not exceed a fortnight, and there is no eruption and no characteristic diarrhoea, and enlargement of the spleen, if it exists, may be due to a previous or concomitant malarial infection. Formerly, when we were obliged to rely on the clinical symptoms alone, this hesitation was justifiable; and, looking to our ignorance regarding infection by organisms morphologically related to Eberth's bacillus, it was dictated by the true scientific spirit; but now we possess an additional method of diagnosing these doubtful cases in Widal's reaction, and recent observations, especially in South Africa, show that 75 per cent. of cases of so-called simple continued fever give the serum reaction which is characteristic of typhoid fever.

Now the case-mortality of typhoid fever in children in India is 7.4 per cent., and as there were 3 deaths returned as from "simple continued fever," it follows that these fatal cases probably represent 40 cases of typhoid fever which were returned under our present heading, but which ought to have been included under that of enteric fever. Instead of the returns showing for 1899 only 27 admissions and 2 deaths from enteric fever among children in India, it probably would be nearer the truth to say that there were 67 cases and 5 deaths. This would leave 59 cases of febricula and simple continued fever which were not enteric, and giving no mortality, instead of 99 cases with 3 deaths, as shown in the returns. Similar remarks might with propriety be made with reference to remittent fever.

The application of Widal's serum reaction test is so easy, and the means of putting it into use have been so multiplied of late years in India, that there is now hardly any excuse for not seeking its aid in the diagnosis of all doubtful continued fevers. The proportion of cases of true typhoid fever in which the reaction does not take place at some period of the disease, and its occurrence in other diseases than typhoid, is so small as to be almost a negligible consideration.

I am here speaking only of Europeans, and this is hardly the place to enter into the question of the diagnostic value of Widal's reaction in the febrile diseases of natives of India. I think it will be found that a very large percentage of natives of India who are not suffering from any febrile condition, and who have never, or certainly not for many years, suffered from any fever which could be by any possibility diagnosed as enteric fever, give the reaction in a perfectly characteristic way. I have myself found it present in dilutions of 1 in 50 within half an hour in three out of six healthy natives of India living in London during the present year. The doubt which this observation throws on conclusions founded on the serum test in the diagnosis of febrile states in natives of India is sufficiently obvious.

I may add that in four cases convalescent from what was returned as "simple continued fever" in South Africa, I have found Widal's reaction in three, and this seems the usual proportion. In the fourth case, which did not give the reaction, the whole course of the case and the character of the sequelæ pointed quite clearly to enteric as having constituted the real cause of the disability.

TUBERCLE.

The question of tuberculous disease among European children in India has already been discussed by me in my report on the Congress on Tuberculosis at Berlin in 1899, which will be found reproduced in the Annual Report of the Sanitary Commissioner with the Government of India for 1898.

The statistics of the civil populations are not full enough or accurate enough to give us any information on this point, but there is a very general consensus of opinion among Indian medical authorities that it is much less frequent among children in India than it is at home.

"Taking strumous enlargement of the cervical glands as the commonest and most obvious form of tuberculous infection in children, Chevers states that he never saw a case in a native of the plains of India. In the orphan asylums of Calcutta, with an aggregate strength of 561 Europeans, East Indian, and Armenian children, and between 400 and 500 admissions to hospital per annum, there were, according to Webb, who was in charge of them for many years, no entries for scrofula."

Tabes mesenterica is certainly very rare among the civil population. Chevers says he never admitted a case to hospital. Moorehead does not mention it as occurring in the large Byculla schools at Bombay, neither do Webb and Fayer as regards the Calcutta schools, and the records of the Madras orphan asylums are also silent with regard to it. I cannot myself recall more than a few doubtful cases.

It was at one time, however, apparently very prevalent among the children of European soldiers serving in India, as the following figures show:—

					Admissions.	Deaths.
1880	..	..	..	..	56	26
1881	..	..	..	..	43	24
1882	..	..	..	..	31	15
1883	..	..	..	..	32	21

Tabes mesenterica has become much less frequent of late years, and in 1896 there were only two admissions and no deaths in a strength of 5,790 European children," and in 1899, 8 cases and 4 deaths. The other tuberculous diseases for which there were admissions during the latter year were scrofulous glands 4, and tubercle of the lung 2. The 4 fatal cases (all from tubercle of the intestine) occurred in children, 2 under six months, 1 between six and twelve months, and 1 between two and five years; 3 of the 4 deaths were in children under one year.

TUBERCULOUS MENINGITIS AND HYDROCEPHALUS.

Tuberculous meningitis is met with from time to time among European children in India, but tuberculous disease of the hip-joint is "certainly unusual in India" (Birch). Chevers, in his long experience in

India, saw only one solitary instance in a European girl—I never saw one myself. Hydrocephalus is by no means rare.

PULMONARY PHTHISIS.

Of 15,116 deaths among the civil population of the North-West Provinces in 1897, verified by the medical staff and a professional agency, only 40 deaths from tubercle of the lung were so certified, and of these only 6 were children, all under the age of 18 months. This offers a great contrast to the statistics of European countries. There were 1,324 deaths from phthisis in England and Wales in 1899 in children under 5 years of age, constituting 3.1 per cent. of the total mortality from that disease, and where the percentage of phthisis to total mortality is 7.3 against 0.26 in the North-West Provinces of India, according to these statistics. Thus while the admission-rate for all tuberculous disease appears to be higher among European children in India, the death-rate and case-mortality are both lower. Here, however, the habit of invaliding to England may interfere with the true relationship of the figures to the facts. This remark does not invalidate the figures given above for the native population of the North-West Provinces.

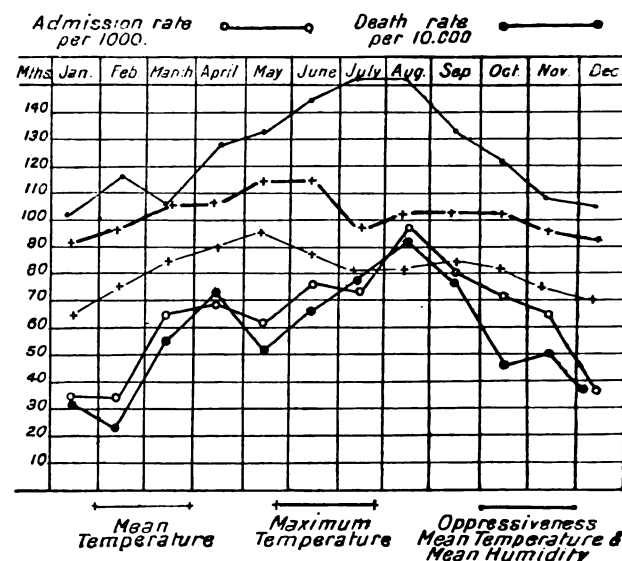
ANÆMIA, DEBILITY, AND PREMATURE BIRTHS.

I have reserved to the last the diseases included under anæmia, debility, and immature birth, because they may be regarded as the master-key to the explanation of the figures we have considered under the different heads. These diseases gave 20 per 1,000 more admissions among children in India than in the United Kingdom—38.3 per 1,000 against 18.3 or fully twice as many. The death-rate was also $2\frac{1}{2}$ times greater, while the case-mortality was only greater in the proportion of 6 to 5. It is to be noted that every one of the children born prematurely died—14 in number.

GENERAL CONCLUSIONS.

The lessons we learn from these, I fear somewhat tiresome, figures, is that while European children in India enjoy a certain relative degree of immunity from some of the diseases prevalent in childhood, especially as regards respiratory diseases and the eruptive fevers, "other general diseases," and, to a slight extent, diseases of the digestive system, their death-rate and the case-mortality from all diseases, with the solitary exception of tubercle, is higher, in fact, more than double those prevailing in the United Kingdom among the same class. The difference in case-mortality is not in any one disease or class of disease, but is common to all, though it is most marked in those of the digestive system, the respiratory and nervous systems, and in "other general diseases." The key to this high death-rate is to be sought for, not in a greater virulence of any or all of the diseases included in these groups, but in the debility produced by an enervating and exhausting climate, which saps the strength and renders the struggle for life so difficult and so pathetic in these little sufferers. Who has not sat by the bedside of a child suffering from pneumonia, we will say, and which has to fight not only with a grave and vital disease, but has to struggle at the same time against the exhausting effects of the high temperature

of an atmosphere saturated with moisture, with the sleeplessness caused by prickly heat and mosquitoes, and wondered not that the case-mortality of the disease was 44 per cent., but that it was not more, and so with all the febrile, inflammatory, and exhausting diseases of children in India. So much impressed was I with this physical exhaustion, the effect of climate, as the principal cause of the high mortality and suffering in illness, especially among children in India, that when the General Hospital in Calcutta was to be rebuilt, I went earnestly into the question of cooled hospitals in India, where the internal temperature should never be allowed to rise above 75°. Lord Elgin took up the idea with enthusiasm, but it was found that the expense of such a scheme was so enormous as to be prohibitive. I do not altogether, however, despair of some such scheme being some day feasible on a small scale. The great cause of expense in such a proposal is the difficulty of removing the moisture before admitting the cooled air to the wards. How closely the admission-rates and death-rates are related to the heat and moisture of the atmosphere is clearly seen in the following table, which shows graphically the admissions per 1,000 and the death-rate per 10,000 for each month of the year.



In this diagram I have also traced in its upper part three lines which represent in order from below upwards the mean temperature, the maximum temperature, and the "oppressiveness" of each month of the year. I have chosen for the purpose the meteorological returns for Nagpur, which may be regarded as the central point of India, and to represent generally the course of temperature, &c., in an inland province. I have plotted out the curves for other stations, but though they differ from each other in detail, they have the same general character, which is enough for my present purpose. It is obvious that the sick-rate and death-rate curves are not closely related to the mean temperature. This reaches its maximum in May, and declines through June, July, and August, whereas the sick-rate, and more especially the death-rate, rise

from May through June and July to their maximum in August. The fierceness of the maximum temperature is reached in May and June, and falls nearly 20° in July and August. With the fall of maximum temperature in July there is a slight diminution in the sick-rate, but an increase in the death-rate, and both rise again in August. It is in the upper line that the parallelism is most marked at this season. This is the curve of "oppressiveness," and is obtained by adding the mean humidity to the mean temperature, and it may be taken as representing the stress and exhaustion caused by "climate." It rises steadily from March, and reaches its maximum in July and August, corresponding with the maximum of sickness and mortality, and as it declines steadily towards the end of the year, the sick-rate and death-rate decline with it. The comparatively high curves of March and April correspond with the sudden rise of maximum temperature in March and April, more marked in other stations than in Nagpur, as, for instance, in Lucknow, where the difference between the maxima in February and March is 30° , and is accompanied by a rise in every class of disease. The dip in May is difficult to explain on meteorological grounds, but the rise in the death-rate in November is due to malarial fevers and respiratory diseases, due the former to the prevalence of mosquitoes, and the latter to the onset of cold nights.

In the following diagram I have traced the admissions per month (1875) for ague, remittent and con-

admission-rate of August is due to diarrhoea, and that this disease to a large extent determines the character of the curve of the admission-rate from month to month, as shown in the preceding diagram. It shows at a glance the prevalence of each of these diseases during the successive months, and does not seem to require explanation.

FILARIAL ABSCESS.

By J. PRESTON MAXWELL, M.B., B.S., F.R.C.S.

China.

ABSCESS of the scrotum is a disease by no means common in England, even granting the inclusion of tuberculous abscess connected with the epididymis and testicle; and it was with some surprise and not a little incredulity that I found myself, soon after my arrival in China, confronted by a patient whose scrotum, swollen to the size of a large foetal head, appeared to be little more than a bag of pus.

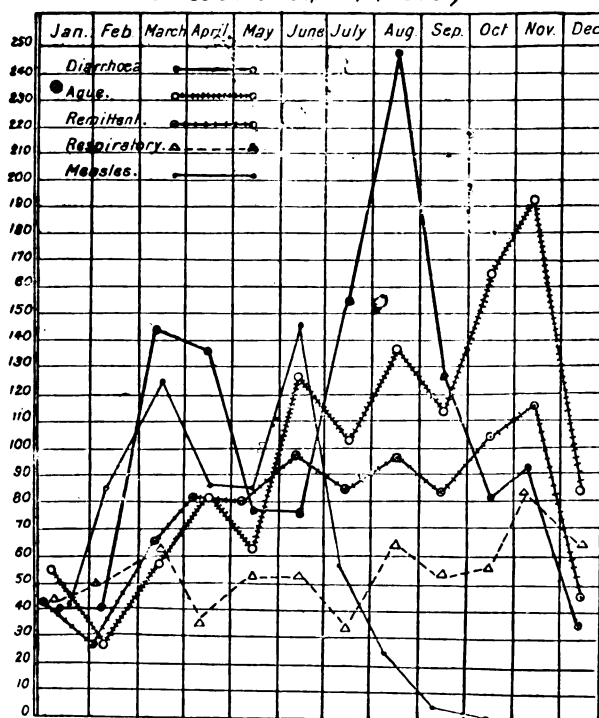
His history was a curious, but at the same time typical, one, although I did not know it to be such at the time I mention. Fifteen days previously, while at work, he had been seized by a violent rigor, which lasted about ten minutes, and passed into fever, which had been persistent since. He was cognisant of no previous illness, and denied any attacks of lymph fever, stating he had been a strong man all his life. He was aged 42. He refused to come into hospital, and I refused to operate in his dirty hovel.

Eventually part of the scrotum sloughed, and after a long illness the man recovered. His subsequent history is reported in the appended table of cases (No. 1).

After I had seen and operated upon one or two of the cases, I determined to try and find out the cause. Gonorrhoea could be easily excluded, as not more than 30 per cent. of the patients confessed to having had it. None of them had any sign of it at the time of their illness, none had stricture of the urethra, and the oclitis present was slight, and in many cases absent. And besides the fact of the abscesses being mostly outside the testicle and seminal tract, the further knowledge that Morris, in his "Diseases of the Urinary and Generative System," did not mention such an affection, put the same, in my opinion, out of court. Injury with the suppuration of a consequent hæmatoma next occurred to me as a possible cause. But in every case in my list injury could be absolutely excluded.

Infection by the bite of some insect could also be excluded. I was fully aware that Manson, in his "Tropical Diseases," mentioned abscess as a manifestation of filarial disease, but I was not aware that it might be the first and only manifestation. However, I began to systematically examine the blood of the patients, who suffered in this way, with the result that everyone was found to be suffering from filarial sanguinis hominis nocturna, and in considering the subject of filarial abscess every doubtful case, that is to say, every case in which I could not find the parasite or obtain a definite history of lymph fever has been excluded. Only about one in ten of abscess I

Admission to Hospital, (1875.)



tinued fevers (together), diarrhoea and measles, as showing how they respectively affect the health of European children in India; and from this it will be seen that the cause of the bad pre-eminence in the

have judged to be filarial in origin have been excluded owing to this test, and not one of these were abscesses of the scrotum. To turn to the general question of filarial abscess, its incidence is naturally only limited by the incidence of infection with the filarial parasite, and it may occur either as an incident in the course of filarial disease, or as the first symptom and sign of the same. In my experience it may occur in any situation where there is loose connective tissue, rich in lymphatics, and for this reason the majority of abscesses outside the scrotum are in the vicinity of the great vessels, and the abscess does not always form in the situation where the inflammatory focus starts. In two of the cases in which I have opened a filarial abscess over the lower end of Hunter's canal, I have good evidence that the inflammatory focus was first situated in Scarpa's triangle. Both the patients themselves and my own students who saw the cases before I did, are perfectly clear on this point; and this evidence is important as bearing on the question of pathology.

Previous observers have opened these abscesses and found the dead body of a parent filarial worm, and have justly surmised that some at least of these abscesses were the result of the death of the parent worm.

In one of my cases I found portions of the body of a parent worm, but in none of the others could I find anything of the kind, although a most thorough search was carried out. In some of these, however, the abscess was of some standing, rendering the absence of a dead parent worm insufficient proof. I regret to say that lack of apparatus has up to the present prevented me from a thorough bacteriological examination of these abscesses. On two occasions I inoculated broth cultures without any result, and in some there are undoubtedly ordinary pyogenic organisms, but these are cases which have been neglected, and in which the skin is about to slough.

I am inclined to think that some are due to a cause other than the death of a parent worm. I was fortunate enough to be able to observe the whole process in a patient, who was in hospital for a trivial affection. Within a day or two he had an attack of filarial lymphangitis of the cord on both sides of the scrotum; the one side came to suppuration, the other did not. Both, at the outset, presented exactly the same appearances, the inflammatory process on the one side being apparently much the same as on the other; and on two other occasions by promptly putting the part at rest and applying cold, I have been able to abort the inflammatory process.

But as a rule a sharp local attack leads to the formation of pus. And there is another fact which has to be taken into account in considering the pathology. As I shall hereafter show, some of these abscesses in the scrotum are suppurating hydroceles. In this case it is difficult to see where death of a parent worm can come in, as I believe they have never been found inside hydroceles. I am inclined to think that the majority of these are due to a local cause, and probably connected with the blocking of lymphatic vessels. I have no evidence to offer in support of this view save the fact that in some of these cases the abscess is the first manifestation of an

affection which ends in elephantiasis of the scrotum or affected limb. In others it certainly does not, but possibly this is due to the fact that a lesser area of the lymphatic system has been interfered with.

Passing from the pathology of the disease to its clinical form and diagnostic points, I would provisionally classify these abscesses as follows: Filarial abscess (*a*) of the scrotum—(1) suppurating hydrocele; (2) abscess of the cord; (3) abscess below the testicle; (*b*) of the limbs; (*c*) intraabdominal or intrathoracic.

Concerning the cases contained in division (*a*) the division may seem at first sight to be arbitrary and unnecessary. A further consideration will show that this is not so. Commencing in the way which is common to all abscesses, they follow different courses, and have to be treated in a different way.

(1) *Suppurating Hydrocele*.—The patient has generally got a hydrocele of moderate or large size already present. At the commencement of the attack this swells to nearly double its previous size, and becomes intensely tender and painful. In a day or so its contents are purulent, and if left to itself the wall and skin over it will slough and the contents discharge. A long convalescence may ensue, as the hole thus formed may be very large. Tapping is only of use in the early stage, and when the contents have become purulent, incision and drainage should be adopted. Care should be taken to have the opening at the most dependent part, and the thick layer of lymph lining the hydrocele sac should be removed. Free bleeding will ensue, and the cavity may have to be packed for twenty-four hours with gauze. Healing is usually rapid, but care has to be taken not to allow the external opening to close too soon. I need hardly say that strict antiseptic precautions should be observed.

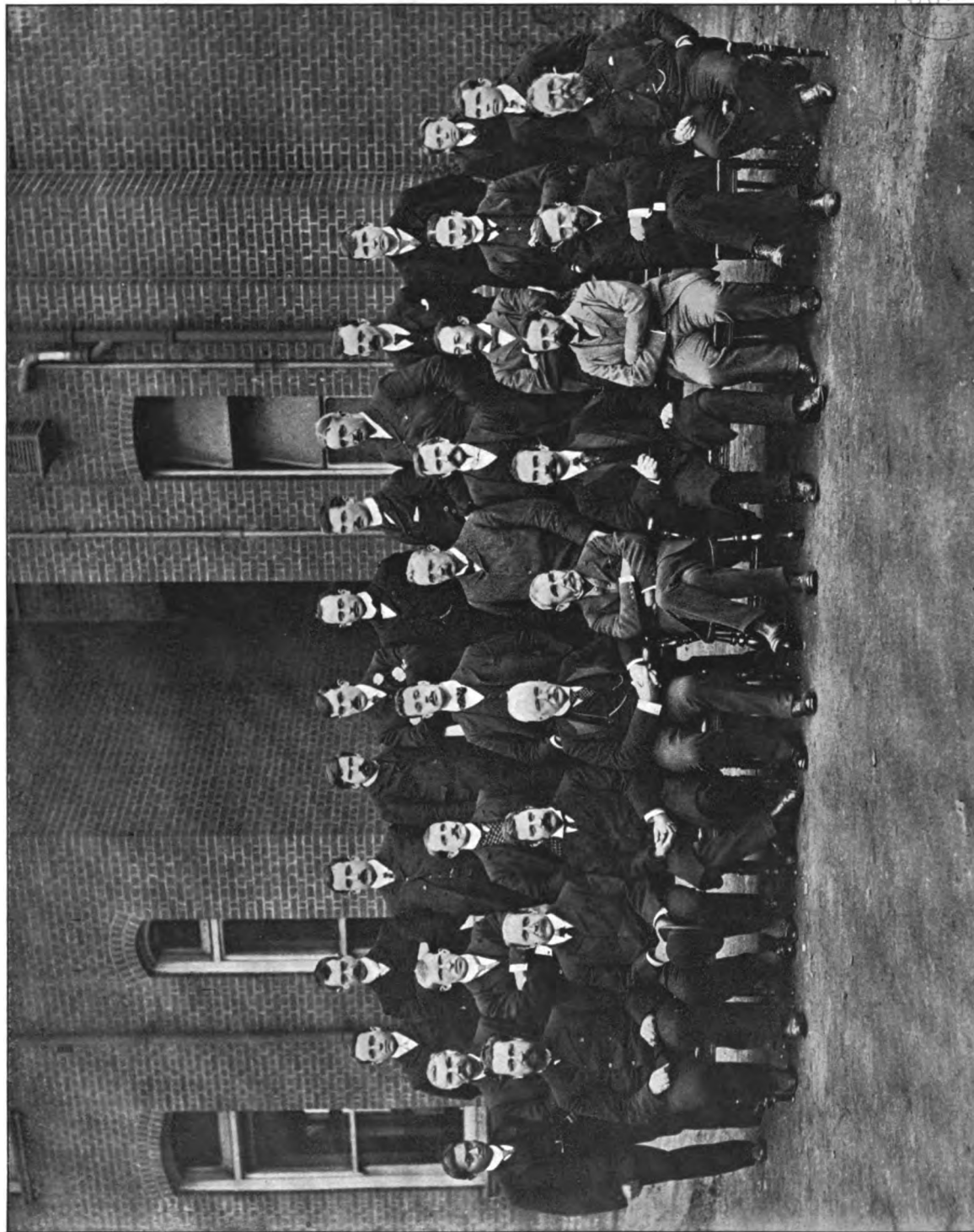
(2) *Abscess of the Cord*.—This is the most serious of the forms of abscess affecting the scrotum by reason of the liability of the inflammatory process to spread up the cord. In several cases I could trace the cord as a great hard rope as far up as the internal ring; moreover, it was intensely tender. Whether in these cases there is any associated inflammation of the peritoneal surface or not, I have no positive proof, but the fixity and tenderness of that part of the abdominal wall is suggestive, and it is well known that an acute septic infection of the cord may spread inwards and set up an acute septic peritonitis. But although the inflammation in these filarial cases may spread up the cord, the actual abscess in all the cases I have seen is outside the external abdominal ring. It is also the most serious of the forms of abscess affecting the scrotum as regards treatment. The abscess is apt to have loculi and pockets which interfere with the free drainage, and consequently with rapid healing.

(3) *Abscess below the Testicle*.—This is the most simple of the filarial abscesses occurring in the scrotum. Drainage is easy and healing is rapid, a few days sufficing to end the affection, which does not extend far and is not of large size. It was from one of these I obtained the portions of a parent worm, and I should not be surprised if all the abscesses in this situation are due to a similar cause.

Turning now to (*b*) *Filarial Abscess in the Limbs*.

LONDON SCHOOL OF TROPICAL MEDICINE.

7th Session, Oct.-Dec., 1901.



T. E. Rice, J. Ritchie Brown, F. G. Hopkins, C. M. Heanley, P. T. Manson, A. L. N. Maclean, C. S. Clark, J. P. Tullock, T. V. Campbell, C. E. S. Watson, M. Ba-Ket, E. A. R. Laing, G. B. Warren (Laboratory Assistant), J. T. Bradley, B. G. Brock, R. N. Moffatt, J. A. Perez, A. Terzi, Robert (Laboratory Boy), D. M. Ford, A. P. Tjellström, Mr. Michell, Prof. Hewlett (Lec.), Dr. Manson (Lec.), Dep.-Inspector, General Bentham, R.N., Dr. Sambon (Lec.), C. Daniels (Med. Sup.), A. N. de Gruchy, E. Symonds, Absent:—J. C. Maxwell, B. Metcalfe, E. A. Parsons, E. C. Long, Prof. Ludwig Aschoff.

Reid & Danielsson, Ltd., London.

FILARIAL ABSCESS: STATISTICS OF CASES, 1899-1901.

No.	Initial	Sex and Age	Occupation	Situation	Previous Filarial History	Microscopic Results	Subsequent History
1	K. T.	M., 42	Shop	Scrotal abscess	None	<i>Filaria sanguinis hominis</i> nocturna. Many	Recovery, but subsequent attacks of elephantoid fever
2	J. S.	M., 31	Shop	Abscess of cord	None	Do. Many	Recovery. See No. 3
3	J. S.	M., 31	Shop	Perineum	Previous filarial abscess	Do. Many	Recovery. The perineal abscess was separated by some interval from the other, and was due to another definite attack
4	K. T.	M., 57	None	Abscess of cord	None	Do. Many	Recovery. Subsequent history unknown
5	T. T.	M., 26	Fields	Abscess below testicle	Attacks of lymph fever	Do. Many	Recovery. Subsequent attacks of elephantoid fever
6	C. C.	M., 33	Fields	Suppurating hydrocele	None	Do. Two in three slides	Recovery very slow. Inflammation had spread to cord before admission, but there was no abscess outside the hydrocele
7	J. ..	M., 40	Fields	Abscess of cord	None	Do. Many	Recovery. No subsequent attacks in 18 months, but commencing elephantiasis scroti
8	T. I.	M., 51	None	Abscess of cord and suppurating hydrocele	None	Do. Many	Recovery. No subsequent attacks in past year
9	K. U.	M., 25	Fields	Abscess of cord	Obscure history of slight attacks	Do. Three in two slides	Recovery rapid. Subsequent history unknown
10	O. T.	M., 40	Fields	Abscess below testicle	Attacks of lymph fever	Do. Many	Recovery. Subsequent history unknown
11	K. ..	M., 40	Fields	Suppurating hydrocele	None	Do. A few	Recovery. Subsequent history unknown
12	K. ..	M., 42	Fields	Suppuration below testicle	None	Do. One in two slides..	Recovery. In this case portions of a parent worm were obtained
13	C. I.	M., 29	Fields	Suppuration below testicle	Previous lymph fever	Do. Many	Recovery. Subsequent attacks of elephantoid fever
14	K. K.	M., 36	Fields	Abscess of cord	Doubtful history	Do. Many	Recovery. Subsequent attacks of elephantoid fever
15	H. ..	M., 45	Preacher	Abscess of cord	None	Do. Many	Recovery. Subsequent attacks of elephantoid fever, and commencing elephantiasis scroti
16	J. ..	M., 29	Fields	Abscess of cord	Previous lymph fever	Do. Many	Recovery. Subsequent attacks of elephantoid fever
17	E. ..	M., 28	Fields	Popliteal abscess	None	Do. Many	Recovery. Sinus still persisting, and commencing elephantiasis of leg
18	J. ..	F., 43	Honsework	Popliteal abscess	None	Do. Many	Recovery. Small sinus persists. No further attacks in 6 months
19	O. ..	M., 19	Fields	Suppuration in thigh	None	Do. A few	Recovery. Commencing elephantiasis of leg
20	K. ..	M., 41	Fields	Suppuration in thigh	Previous attacks	Do. One.. ..	Recovery. No attacks since, but history too recent—a week or two
21	S. ..	M., 48	Fields	Axillary abscess	None	Do. Many	Recovery. No subsequent attacks in a year
22	J. ..	M., 50	None	Retroperitoneal abscess	Previous attacks	Do. None	(?) Discharged himself, very low at the time. Abscess opened at border of erector spine
23	A. ..	M., 48	Shop	Ilio-pelvic abscess	Previous attacks	Do. None	Simulated appendicitis. Still under treatment, will almost certainly recover

As I have previously stated these occur in situations rich in lymphatic tissue, and generally in the immediate neighbourhood of the large vessels; and it is not an uncommon thing, on opening one of these abscesses, to be able to put one's finger on, or even around, the main vessel of the limb. It is one proof of the low form of inflammatory process that I have never seen one of these vessels give the slightest trouble from secondary hæmorrhage due to softening of the vessel wall and subsequent rupture.

Of these abscesses, those in relation to the femoral artery give the most trouble. This is partly on account of their deep connections and the difficulty of thorough drainage. And in some of them the lymphatic system seems to be so disorganised that they pass directly into the commencement of an attack of elephantiasis of the limb. Consequently one must be guarded in one's prognosis of the ultimate result of treatment.

The treatment consists in free drainage, and owing to the difficulty of draining the deeper portions, it is well to make free openings under chloroform and insert large drainage tubes. Troublesome contracture of the lower limb may occur during the healing of large abscesses, especially those involving the popliteal space, and should be avoided by splinting the limb, and using massage as soon as possible. But among my Chinese patients who are absolutely intolerant of restraint, and over whom one has not the same command as at home, I am sorry to say troublesome contracture is by no means unknown.

(c) *Intraabdominal and Intrathoracic Abscess.*—Of the latter form I have no experience, but of the former I have met with two cases.

In each case the illness coincided with the cessation of lymph fever attacks, and each case was desperately ill when admitted to hospital. Both had commenced

in the way I shall hereafter describe as typical. In the one case I found deep fluctuation in the left lumbar region and opened an abscess under chloroform, which was post-peritoneal and apparently had no connection with any of the large abdominal organs. The urine contained the faintest traces of albumen, but neither formerly or at the time of operation were there any symptoms pointing to disease of that organ. This case left hospital by his own request, and was still desperately ill. The abscess was draining well, but as he had been ill two and a half months and was very weak, his recovery was far from certain, and the case is too recent for me to have had opportunity of learning the result. The second came into hospital looking like a typical case of appendicitis. He also

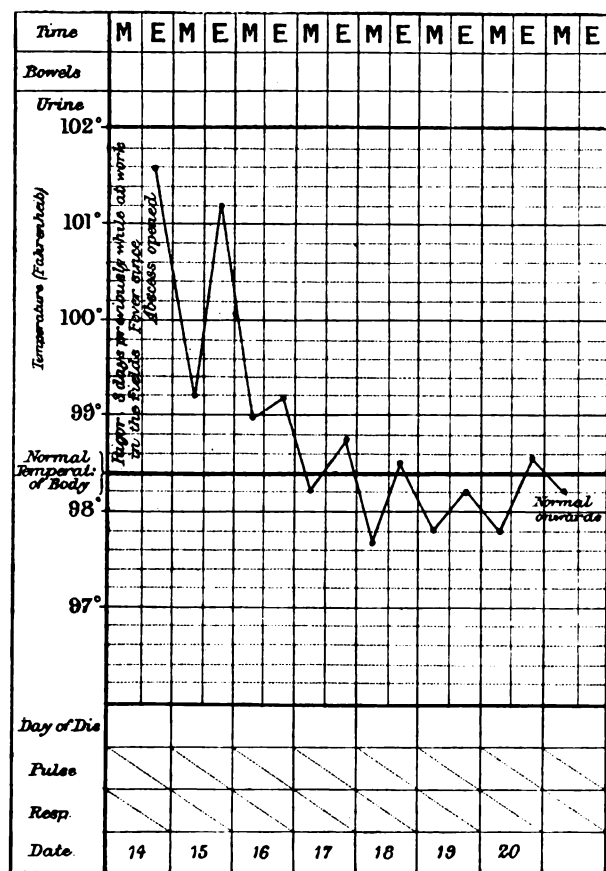


CHART A.

was very ill and had been so for a month and a half. The abscess proved to be extraperitoneal and extended both into the iliac fossa and down into the pelvis. In my opinion it began in the loose tissue about the iliac vessels, and the fact that the disease began with a rigor, and immediate flexion of the right thigh on the abdomen to an extent I have never seen in an uncomplicated case of appendicitis gives some colour to this supposition. This case is still under treatment and the abscess cavity shows no great readiness to heal up, while the patient is extremely weak, so that it is difficult to say how this case will end. His bowels were regular and natural at the time of the attack.

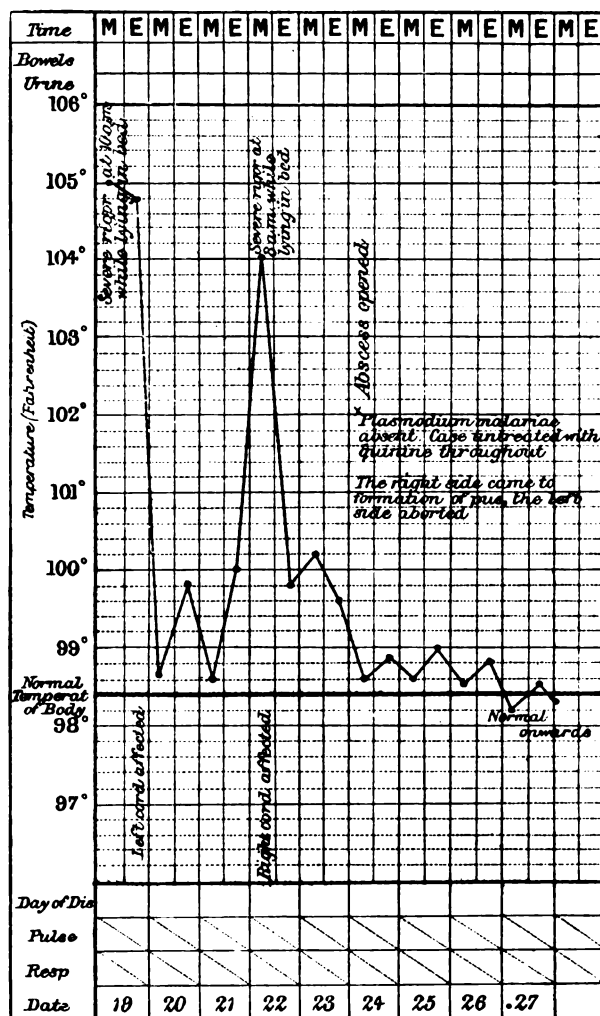


CHART B.

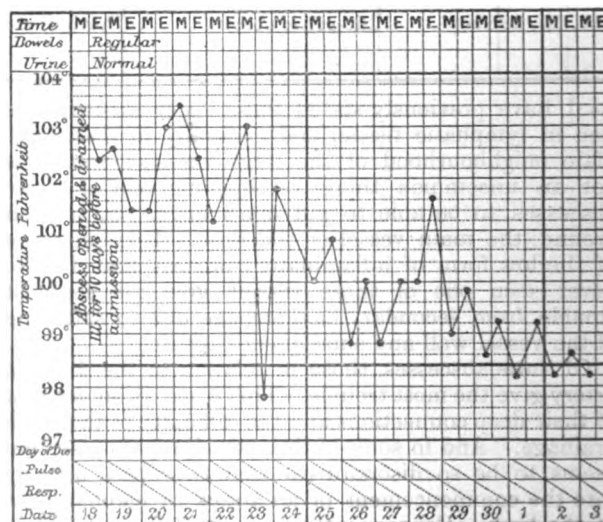


CHART C.

I believe that Manson's advice on the subject of these abscesses is sound: "Deep-seated pain in the thorax or abdomen with inflammatory fever followed by hectic fever and a diminution in the number of embryo filaria in, or their entire disappearance from the peripheral blood, should, in such circumstances, suggest a diagnosis of filarial abscess and indicate exploration, and if feasible, active surgical interference."

Finally, we must discuss the onset of this malady and its typical temperature. Chart A is what I judge to be a typical temperature chart of the disease.

Rising rapidly with a rigor, which may occur while the man is at work in the fields, or cutting wood, or even lying in bed, it remains high for one to three days, and then descends by lysis, provided an unopened abscess is not left. On the other hand, if the patient be under favourable conditions and it is possible to abort the attack, the temperature may descend very rapidly. (See Chart B.)

In neglected cases and cases which do not run a proper course owing to insufficient drainage or wide inflammatory focus, the temperature may assume a septic type. (See Chart C.)

In criticism it may be urged that this temperature is the result of the plasmodium malarie complicating the filarial attack. I reply, I would rely upon the following facts, first, that in many of the cases the blood was carefully examined by me for plasmodium malarie with a negative result; secondly, that it is quite possible for the fever due to the presence of filaria sanguinis hominis and active malarial attacks to run concurrently, but in these cases both the diseases are clinically and microscopically distinct, and, moreover, the patient, as I have proved in two instances, has been right in his statement that one night he had a filarial attack and the next an ordinary quartan paroxysm. I may add that in no case of filarial abscess of the limbs was there any focus of infection to be discovered on the surface of the limb.

PERSISTENCE OF YELLOW FEVER INFECTION ON SHIPBOARD.—A steamer arrived on September 21st at Santiago, six days out from Jacksonville, with three cases of yellow fever on board. The vessel left Progreso six weeks previously, and arrived at New York with one case of fever on board. The man died in the harbour, and the ship was disinfected. The steamer left New York in apparently clean condition, but the captain's wife was taken ill soon after leaving this port and died while on the way from New York to Jacksonville. One man died the day the ship arrived at Santiago, and the autopsy showed plainly that he had been suffering from yellow fever. The crew was removed to the yellow fever hospital, which is situated on an island two miles from the city. The steamer was fumigated and held in quarantine in the lower bay, and in the course of a few days eight new cases of the disease developed among the crew.—*Medical Record*, September 28th, 1901.

THE DISCOVERY OF THE BACILLUS OF LEPROSY.—Dr. H. P. Lie, the present Director of the Leprosy Hospitals of Bergen, contributes an interesting biographical sketch of Dr. Gerhard Henrik Armauer Hansen to *Lepra*. Dr. Hansen was born in Bergen in 1841, and received his early education in the Cathedral College of that town. After passing his medical examinations, he became a resident in the Rigshospital, of Christiania, and later spent some time as medical officer to the great Lofoten fisheries. In 1868 he became Assistant Medical Officer to the Bergen Leper Hospital, of which Dr. C. Danielssen was director. It was under the influence of this enthusiastic teacher and acute observer that Armauer Hansen began his life-long study of leprosy. His first investigation was to work out the significance of the so-called globi, or leprosy cells, of Virchow. These bodies had been already referred to in 1840 by Danielssen, who thought they were characteristic of the disease. This idea he afterwards gave up, and came to the conclusion they were the results of an involution process, that is, fatty degeneration. Hansen was not satisfied with the latter explanation; he thought that Danielssen's first idea was more likely the right one. This led him to investigate the matter, and in 1869 he published his results in a Norwegian periodical. At this time Hansen spent a year at various universities, but on his return to Norway he again applied himself to the difficulties which surrounded the etiology of leprosy. Various views were held at that time on this point. As a result of his observations and investigations, he published in 1872 an important paper, which gave rise to much discussion in Norwegian medical circles. His researches pointed to the contagious and specific nature of the malady. The Medical Society of Christiania voted a sum of money for him to continue his research. In the course of his journeyings through the country he came across instances of the disease which were more readily explained by contagion than by any other theory. An account of his additional investigation was published in the *Norsk Magazin for Lægevidenskab*. Unfortunately, in 1874, this important contribution to the subject was but little known outside of Norway. His views confirmed those of Dognat-Landré, who had worked at leprosy in Surinam, and published a book entitled "La Contagion seule cause de la lèpre" (Paris, 1869). This led Hansen to reinvestigate the peculiar bodies (globi-brown corpuscles) previously referred to, for he held that if the disease is contagious there must be some specific virus at work. His labours were rewarded by the discovery, in unstained preparations, of bacilli. These were ultimately stained, and are what we know them to be, the bacilli of leprosy. His discovery, be it noted, was made in 1873, that is about ten years before the bacillus tuberculosis was made known to the world by Koch. For years Hansen has repeatedly tried to cultivate and inoculate the bacillus lepræ, which is also deservedly known as Hansen's bacillus, but up to the present fruitlessly.—*British Medical Journal*.

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THE

Journal of Tropical Medicine

DECEMBER 2, 1901.

MEDICAL SERVICE IN THE CROWN COLONIES AND PROTECTORATE.

WE offer no apology for again referring to this all-important subject. The question cannot be allowed to rest until the several units by which the medical service of the colonies is manned and worked are brought together into a single service, and directed from a common centre. Unification must be the sole aim at present, and every effort must be made in that direction before other important issues are touched upon. Every medical officer in the service of the Crown Colonies and Protectorate has some advice to give in the direction of improvement, but until the service has a sure base to start from, alterations here and there are mere patchwork and tinkering to no purpose.

Questions of allowances, pay, pension, invaliding, leave, finding substitutes, &c., are pressing,

and it is because they are pressing and because they urgently require consideration, that unification is imperative. Unless the medical men at present in the service appreciate this point, this essential principle, it is well-nigh impossible for their brethren in the profession to help them.

We invite comments upon the subjoined scheme, drawn up by a Committee of the Council of the British Medical Association, and styled at the time "The West African Medical Service Committee," but reconstituted in August, as

"THE CROWN COLONIES AND PROTECTORATE MEDICAL SERVICE COMMITTEE,"

In expressing an opinion upon the Colonial Medical Service the Committee feels that the Service is a general service in which men may be moved from one place to another, and that, therefore, the most complete unification obtainable is to be sought.

That although it may be expedient to organise as a temporary measure the conditions of service in particular districts, no satisfactory permanent result is obtainable by any piecemeal dealing with the subject.

SUGGESTIONS.

1. That the service be called the Colonial Medical Service.

2. Candidates for appointments in the Colonial Medical Service should hold qualifications which are registrable in Great Britain, or such other medical qualifications as may hereafter be determined and approved.

3. It is desirable to hold an open competitive examination in London under the authority of the Colonial Office for admission to the Service.

4. Candidates should not be over 30 years of age, and be physically eligible to undertake duty in warm climates.

5. All successful candidates who have not previously taken up a course of tropical medicine, and produced evidence of proficiency, shall be required to do so before proceeding to take up their appointments. During the period of receiving instruction a small daily allowance should be made to cover expenses of training, this to include lodging and mess allowance.

6. Definite grades and uniform nomenclature should be established throughout the service.

(a) All candidates on appointment should be given suitable designation and titles to distinguish them as belonging to the Colonial Medical Service and to designate their trade.

(b) The following titles appear convenient:—

1. Assistant Colonial Surgeon, 1 to 5 years' service.
2. Colonial Surgeon, 5 to 8 years.
3. Senior Colonial Surgeon, 10 to 15 years.
4. Principal Colonial Surgeon, 15 to 25 years.
5. Deputy-Inspector-General, 25 years and upwards.
6. Inspector-General, Colonial Medical Service.

This Colonial medical officer to be responsible for the administration of the Service throughout the Crown Colonies and Protectorates under the Colonial Secretary.

A Colonial Medical Board would be attached to his office for duty.

- (c) The service being thus unified, opportunities for change of station on promotion from grade to grade should be encouraged. A medical officer should be able, however, to proceed from grade to grade without changing station should he desire it.
- (d) Promotion for meritorious service should be entertained on the recommendation of the Governor in Council.

I.—ORGANISATION.

The medical officers employed in each Crown Colony or Protectorate should be organised into a medical service, at the head of which should be the senior medical officer who should be an *ex-officio* member of the Council of the Colony or Protectorate.

II.—PAY.

The pay should not be less than £350 at the commencement. Seeing that the conditions and expenses of living differ so materially in different colonies, additional allowances would have to be established by the local Councils for all medical officers serving in that colony.

For such extra duties as *post mortems*, inquests, travelling claims, &c., extra pay should be granted.

For every twelve months spent in the West Coast of Africa leave for six months should be granted to the medical officer as to other officers in the colonial service.

There should be no restrictions as to the invaliding of sick officers by a properly constituted Board.

III.—GRATUITY.

7. After 10 years' service, a Colonial medical officer should have the option of leaving the service on a gratuity of £1,000, thereby waiving all pension claims, and after 15 years' service a gratuity of £1,500.

IV.—PENSION.

8. A medical officer should be entitled to retire after 20 years' service on a pension of £1 a day, and after

further service with increasing increments of 2s. 9d. per day for every 2½ years of service. Fifteen years' service on the West Coast of Africa to count as 20 elsewhere.

V.—QUARTERS.

Properly constructed tropical quarters in accordance with the teachings of sanitary science should be provided, and, where this is not practicable, an adequate allowance should be made.

VI.—MESSING.

That suitable mess quarters should be provided for the medical officers, and facilities given for organising the mess.

We hope medical men in the Crown Colonies and Protectorates will come forward with their opinions upon this scheme. For the moment it is not pay, &c., which is the point of primary importance, it is unification and organisation of the scattered units of the service into a real service on a footing with the other public services of the country.

IDENTIFICATION OF MOSQUITOES SENT FROM TRINIDAD.

To the Editors of THE JOURNAL OF TROPICAL MEDICINE.

DEAR SIRs,—I have forwarded to you specimens of two species of *Culex* mosquitoes, and I shall feel obliged if you will have same identified for me. They are the common house pests here during the rainy season, and I am desirous of investigating their connection, if any, with the prevalence of malarial fever, leprosy, &c. One of them, the brown, I have already found to be an efficient host for *filaria nocturna*.

Yours, &c.,

St. Ann's Port of Spain, GEO. A. VINCENT.
Trinidad, W.I.

October 10, 1901.

REPORT ON THE ABOVE MOSQUITOES.

By F. V. THEOBALD, M.A.

DEAR SIRs,—The box of mosquitoes from Trinidad, collected by Mr. Vincent, contained, as the collector says, two species. One is *Stegomyia fasciata*, Fab., the other the common *Culex fatigans*, Wied. Both species are well-known household forms, and have a very wide distribution in tropical and sub-tropical climates, and to some extent spread into warmer temperate climes. The former, for instance, occurs in Italy, Ficalbi describing it from that country as *Culex elegans*.

The *stegomyia* is the supposed carrier of yellow fever—the *Culex* of *Filariasis*. Neither of the above two species at present are known to be in any way connected with malaria, all evidence goes against their having anything to do with it.

British Museum (Natural History).

Article for Discussion.

THE DANGERS OF SUBCUTANEOUS INJECTION OF QUININE.

By F. SMITH, D.P.H. Durham.

Major, R.A.M. Corps, Sierra Leone.

HAVING in view the reputed liability of this form of administering quinine to cause tetanus and abscess, I have only used it in a few extreme cases of coma, &c., and when the patient was too far gone to take the drug by the mouth. No ill result came about and probably some lives were saved. Therefore it is well that the subject is brought forward for discussion, inasmuch as it would seem that patients are sometimes lost through the hesitation of the doctor to inject before it is too late.

No great precautions were adopted in the method, because quinine itself was regarded as sufficiently antiseptic. In some cases treated on the march, the skin has merely been rubbed with aqueous solution of hydrochlorate of quinine, such as was afterwards injected. In other circumstances the syringe has been sterilised and the skin disinfected with carbolic lotion. Sometimes the puncture was covered with plaster. But I have seen two very bad abscesses with sloughing after injection of aqueous solution of quinine hydrochlorate. Both cases were under one physician. Septic infection was suspected; therefore in the second case precautions were taken. I saw the syringe sterilised, the solution of quinine heated and the skin cleaned, but did not, I am sorry to say, see the injection actually made. In this case, the patient being unconscious for two or three days, further injections were made and it did not occur to the operator to vary the site; all the injections were made in one arm. The man recovered, but had extensive abscesses, the original puncture not being exempt. This patient was in hospital for months with huge areas of sloughing, exposure of fasciæ, &c.—the areas affected by different injections having coalesced—and he, of course, bears big scars to this day. Therefore, I still avoid quinine injection as much as possible.

What is the cause of these abscesses?

Solution of quinine ought to be antiseptic enough of itself and it is questionable if the abscesses are the results of sepsis alone.

Negative chemiotaxis may explain tetanus. Can the same theory be applied to the abscesses in the case of some supposititious organism which may perchance be unaffected by quinine and flourish in the immediate area of injection where the drug will be strongest?

In appearance the two abscesses suggested direct destruction of the parts affected. A circumscribed area was apparent early, the skin and subcutaneous tissue corresponding to this area eventually sloughing out. There was no subsequent spreading, the exposed surfaces being kept clean, and there were no secondary infections.

It may be that the solution used was not weak enough, but it was similar to that used in all the cases.

Perhaps intravenous injection would be safer as regards abscess, but rectal injection is often sufficient.

Drugs and Appliances.

ABBEE'S SALT.—The pains taken by chemists and others to provide pleasant remedies for the minor ailments of life is a section of pharmacy which is apt to be set aside and at times neglected. Illnesses are fortunately not all of a serious character; the majority of ailments are of a slighter nature, a mere departure from the normal, a temporary physiological upset. Especially of warm climates is this true. The liver is called upon in tropical and sub-tropical countries to serve the physiological functions of the body in a manner altogether in excess of what obtains in temperate climates. The first effect of heat is to excite the action of the liver, but after residing for say twelve months in a tropical climate the liver becomes exhausted, and the balance of function is now above, now below the normal. The consequence is digestive and other troubles, which are ever apt to engender the habit of taking drugs. The ailment is functional merely, and a mild corrective is all that is required. The Abbey Effervescent Salt Co., Ltd., of London, have prepared a salt which is a corrective of the nature indicated, and we have no hesitation in recommending it. It is pleasant to take, and can be used as a refreshing drink, or as a gentle laxative, according to the quantity taken.

HARTMANN'S WOOD WOOL PREPARATIONS.—We have been favoured with samples of Hartmann's Patent Wood Wool Wadding and Wood Wool Tissue, both im-

pregnated with corrosive sublimate. Our experience of these preparations in surgical practice enables us to speak with confidence of their usefulness and reliability. A comparative trial at one of our public hospitals of the virtues of several kinds of antiseptic dressings, shows that the preparations of the Sanitary Wood Wool Company have no superior. Hartmann's Wood Wool preparations in the tropics are well known, and the accouchement conveniences supplied by the Company have proved a boon to travellers and residents in warm countries. We can personally testify to the usefulness of these preparations in tropical practice.

Correspondence.

MOSQUITOES AND LEPROS IN PUERTO PRINCIPLE, CUBA.

To the Editor of THE JOURNAL OF TROPICAL MEDICINE.

SIR,—As showing the conditions of life in a leper country, Puerto Principe Province, Cuba, let me quote from a recent letter from my brother, who is local engineer of Survey Party for the railroad now building from Santiago to Havana (Sir William Van Horn's line).

"We are moving camp," he says, "about every ten days or two weeks, and are working through guinea grass from 8 to 10 ft. high, or through heavy woods with dense undergrowth, in which the mosquitoes are something terrific. Frequently when I am with the peons at the head of the line I make a slap and cover my hands and face with blood from those that have been feeding on me. So far we have all kept perfectly well, as I have Apollinaris, Scotch whisky, and plenty of quinine in camp; but a number of my peons have been sick with malaria, and there is much sickness through the country. We are now camped at El Zanjin, the place where the agreement was signed between the Cubans and Spaniards that ended the ten years' war; and here we have the worst water yet. When we wash we have to dip small fish, tadpoles and mosquito larvæ out of the basins. The rainy season is now on, October being said to be the wettest month.

"Most of the lepers of Puerto Principe province are not isolated. Only thirty are in the hospital."

ALBERT S. ASHMEAD, M.D.

New York.

News and Notes.

IN relation to the recent correspondence in *The Times* and elsewhere, regarding enteric fever and water-filters, it is announced that the Sanitary Institute in connection with its recent Conference on Water Supply, has held an exhibition of the principal filters alleged to prevent infection, and has given its only highest award (the Silver Medal of the Institute) to the Pasteur (Chamberland) Filter.

MALARIA AS AN ANTIDOTE TO CANCER.—Professor Loeffler has suggested the inoculation of a cancerous patient with malaria as a means of cure of the malignant growth. He thinks he has discovered an antagonism between the two diseases, asserting that cancer is a rare disease in tropical countries where malaria is rife.—*Medical Record*, October 26th, 1901.

Current Literature.

YELLOW FEVER.

A MEDICAL BOARD TO EXAMINE CALDAS AND BELLINZAGHI'S YELLOW FEVER SERUM.—An order has been issued at the war department, Washington, convening at Havana a board of medical officers headed by Major Havard, Chief Surgeon of the Department of Cuba, for the purpose of examining into the proposition of Dr. Caldas and Dr. Bellinzaghi, who will submit a cure for yellow fever and a serum designed to prevent the contraction of that disease. Dr. Caldas is a Brazilian, and his proposition recently was submitted to the war department by the Brazilian minister. A letter has been received at the surgeon-general's office from Major Havard saying that two suspected cases of yellow fever had been discovered in Havana. In connection with these experiments the yellow fever commission will supply the mosquitoes. The commission has eight insects which have bitten a person suffering with a bad case of yellow fever. Two of the mosquitoes subsequently bit two persons, who have since developed well-marked attacks of the disease. The eight mosquitoes will be divided into two divisions. Two persons whom Dr. Caldas will inoculate with his serum will be bitten by two mosquitoes each. The other four mosquitoes will bite two non-immunes, two each. As all eight mosquitoes were infected from the same person, and as two of them have already given yellow fever to two persons, it is inferred that the arrangement will afford a good test of the preventive value of the serum, although other experiments will probably be conducted.

Since the foregoing was written Major Havard has announced that the mosquito tests as to propagation of yellow fever will be discontinued. This decision was reached because one of the non-immunes who was recently bitten by an infected mosquito has died of yellow fever. The man, who was a Spaniard, desired to become an immune and therefore allowed himself to be bitten by the mosquito. Another man who was bitten is also dead.

According to Major Havard, the cases due to mosquito infection prior to the latest two were light. But, as the insect infection has assumed a more dangerous form than the first experiments led the Yellow Fever Commission to expect, it is now thought best not to allow Dr. Caldas's and other proposed experiments in this line.—*New York Medical Journal*, August 24, 1901.

INEFFICIENCY OF THE CALDAS SERUM.—Dr. Caldas is returning to Brazil, since his experiments with the alleged yellow fever remedy have resulted in failure. He and Dr. Bellinzaghi went to America some time ago and endeavoured to enlist the co-operation of the Medical Department at Washington, but without success. They then went to Havana, and Governor-General Wood was induced to appoint a commission to investigate the claims of the Brazilians. This board consisted of Drs. Gorgas, Finlay, Guiteras and Agramonte. It has finally decided that under no condition should further experiments of the kind be

made. A full report will soon be made and filed with the Governor-General.

YELLOW FEVER IN CUBA.—Assistant Adjutant-General Colonel Hickey, of the Staff of General Wood, says that not a single death from yellow fever has taken place in Cuba this year. The plague has been successfully overcome by the efficient sanitary measures employed by the United States health officials, the city of Havana itself having been revolutionised in this respect, and the other towns on the island cleaned and renovated. The use of kerosene oil and petroleum for sprinkling the streets and covering the ponds and cesspools has been very efficient in almost entirely exterminating the insects. The amount of oil used is one ounce to every square foot of surface.—*Pacific Med. Jour.*, October, 1901.

DR. STERNBERG ON YELLOW FEVER.—In his annual report to the Secretary of War, Surgeon-General Sternberg, himself an acknowledged authority on yellow fever, adds the weight of his official approval to the mosquito theory. He says: "The results obtained were especially valuable, showing that the bacillus icteroides (Sanarelli) bears no causative relation to yellow fever, and that the mosquito serves as an intermediate host for the parasite of this disease. Further experiments of a most interesting character demonstrated that yellow fever is transmitted to non-immunes by the bite of a mosquito that has previously fed on the blood of those sick with this disease; that yellow fever can also be produced by the subcutaneous injection of blood taken from the general circulation during the first and second days of the disease; that an attack of yellow fever produced by the bite of the mosquito confers immunity against the subsequent injection of infected blood; that yellow fever is not conveyed by clothing, bedding, or merchandise soiled by contact with those sick with the disease; that a house may be said to be infected with yellow fever only when there are present in it mosquitoes capable of conveying the parasite of the disease, and that the spread of yellow fever can be most effectually controlled by measures directed to the destruction of mosquitoes and the protection of the sick against the bites of these insects." He adds that the results of these investigations are of far-reaching consequences.

EXCHANGES.

Annali di Medicina Navale.
Archiv für Schiffs u. Tropen Hygiene.
Archives de Medicine Navale.
Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
Australasian Medical Gazette.
Boletin de Medicina Naval.
Boston Medical and Surgical Journal.
Bristol Medico-Chirurgical Journal.
British and Colonial Druggist.
British Journal of Dermatology.
British Medical Journal.
Brooklyn Medical Journal.
Caducée.
Climate.
Clinical Journal.

Clinical Review.
Giornale Medico del R. Esercito.
Hong Kong Telegraph.
Il Policlinico.
Indian Engineering.
Indian Medical Gazette.
Indian Medical Record.
Janus.
Journal of Balneology and Climatology.
Journal of Laryngology and Otology.
Journal of the American Medical Association.
La Grèce Médicale.
Lancet.
Liverpool Medico-Chirurgical Journal.
Medical Brief.
Medical Missionary Journal.
Medical Record.
Medical Review.
Merck's Archives.
New York Medical Journal.
New York Post-Graduate.
Pacific Medical Journal.
Polyclinic.
Public Health.
Revista de Medicina Tropical.
Revista Medica de S. Paulo.
Sei-i-Kwai Medical Journal.
The Hospital.
The Northumberland and Durham Medical Journal.
Treatment.

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- 2.—Manuscripts sent in cannot be returned.
- 3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.
- 4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.
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Extract from the British Medical Journal, Nov. 10th, 1900.

"THE TREATMENT OF DYSENTERY.

"By WILFRED WATKINS-PITCHFORD, M.B., London, F.R.C.S.Eng., C.M.O. with No. 7 General Hospital, South Africa Field Force, Estcourt, Natal.

* * * * *

"BISMUTH, CHLORODYNE, AND IZAL.—Dr. G. R. K. Crossland, who is one of our civilian medical officers, suggested the use of Izal in 5-minim doses, and this preparation certainly produced amelioration of symptoms. For my own part, after so many disappointments, I have been much gratified to find that Izal combined with bismuth and chlorodyne gives a most satisfactory result. The formula which I am using is—R_y Izal \mathfrak{m} iij, bismuthi subnitratis gr. x, tincturæ chloroformi et morphini \mathfrak{m} viij, mucilaginis acaciæ ad \mathfrak{z} j. To be taken every two, four or eight hours, according to the severity of the symptoms. In the few sporadic cases of dysentery which have arisen in our hospital, this combination of drugs has in every case brought about a rapid cure, and in those well-advanced cases of a severe type which have come under our care the results of its use have been equally gratifying."

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The Malarial Mosquito in Hongkong.

FROM THE

"CHINA OVERLAND TRADE REPORT."

The accompanying notes concerning the existence of the Malarial mosquito in Hongkong were read by Mr. C. V. Ladds at a meeting of the South China Branch of the British Medical Association on Monday evening:—

In a Circular Despatch from the Right Honourable the Secretary of State for the Colonies, dated December 6th, 1898, His Excellency the Governor was requested to forward to the Colonial Office a collection of mosquitoes from the colony with a view to investigating the possible connection of Malaria with this genus of insect.

Two collections were forwarded as requested upon August 18th and November 24th respectively, and none of the species *Anopheles* having been included in these collections it was thought at that time that they did not exist in Hongkong. Having always taken a great interest in the Malaria question, and not being satisfied with the result obtained during the above investigation, I determined to take up the subject privately, and commenced work in December, 1899.

After going thoroughly into the matter, and after having cultivated the larvæ of many varieties of mosquito, I at length found that the *Anopheles* undoubtedly did exist in the colony and was to be found in most of its known malarial districts. I first discovered them close by a Government bungalow at Kennedy Town. The different occupants of this house having been subject to repeated attacks of fever ever since its erection in 1895, I determined to make this place my starting point, and after a very careful examination, I found a small pool swarming with *Anopheles* larvæ within fifty yards of the building.

Extending my search I found the same species near the Kennedy Town Fever Hospital, at Magazine Gap, at Wong-nei-cheong village, near a house on Bonham Road, at Quarry Bay, close by the Taikoo Sugar Refinery, all round the camp of the Welsh Fusilier detachment at Kowloon, and in many other places.

This being sufficient evidence of their existence over a considerable area of the colony, and having now no doubt that they were to be found in all the malarial districts, I next proceeded to examine the particular kind of pool which the *Anopheles* appeared to select as most suitable for the propagation of its species.

A small shallow pool containing algæ, or green flocculent water-weed, and fungoid growths, abounding in all kinds of aquatic insect life, and which is not quite stagnant (or if stagnant at the time of discovery is not likely long to remain so, but is renewed occasionally by small flushes of rain water), appears to be their favourite *habitat*.

In nearly every instance I found them only in such pools, which were in most cases fed by minute streams issuing from small springs in the hill side, and these not being of sufficient volume to scour out a channel of their own, just spread themselves over the surrounding lower ground, and so help to form and feed the typical *Anopheles* pool.

They do not seem to inhabit pools which are entirely stagnant (or likely to remain so long) or which contain no water-weed; and appear to be particularly careful in their selection, as, although there may be dozens of pools in the locality, only a few of them may contain *Anopheles*.

Having repeatedly found the mosquito hovering round a pool which contained the same species of larvæ, it is probable that the adult insect returns to its original home to deposit its eggs, and this theory may, if correct, account in a measure for their not being found scattered indiscriminately about everywhere. After once seeing the particular kind of pool which these mosquitoes affect it is easily recognised, but it is not quite so easy to describe it correctly; yet I trust that I have given a fair general idea of what to look for.

I find by experimenting that the *Anopheles* larvæ appear to feed upon the algæ or water-weed which is found in their particular pools, and also possibly upon some of the animalculæ which they contain. This I proved by placing some larvæ in clear tap water and others in water taken from an *Anopheles* pool which contained water-weed; those in the former dying quickly, while those in the latter hatched out in due course. I should not say that the larval stage of the insect is a long one, probably about a week to ten days, this depending a good deal upon the nature of the pool; after which time they emerge therefrom as adult mosquitoes. The life of the mosquito itself probably extends over a period of several weeks, perhaps longer.

I have so far not succeeded in finding the *Anopheles* larvæ in any of the healthy districts of the colony, or far distant from human habitations, nor have I yet found them in rice fields, in large pools of water, in rapidly running streams, in pools with sandy bottoms, in wells, old broken pottery, tubs, pans, &c., as in the case of *Culex*, which may be found in almost anything which contains water.

In contradistinction to the *Anopheles*, water-weed does not seem to be necessary to the existence of the *Culex* larvæ, they being often found in pools, &c., from which it is entirely absent. A further distinction between the two species being that the former appears to be much more delicate than the latter. It is not necessary here to describe the *Anopheles* larva or mosquito, they being so entirely different from the other species as to be easily recognised after having been once seen. Having satisfied myself as to the existence of the *Anopheles* in the colony, and having given a brief description of its *habitat*, &c., I will now pass on to the possibilities of its extirpation from the island. With this object in view, I have been testing the effects of various insecticides. I found that kerosene used as described by the African Commission was very effective in still pools, or in those which were temporarily stagnant; gas tar also proved to be very useful, but in my opinion **Jeyes' Fluid** is the best of those which I have tried up to the present.

So far as my experiments have gone, I find that one part of **Jeyes' Fluid** to 10,000 of water kills both *Anopheles* and *Culex* larvæ in a few hours, very much weaker solutions destroying them after a longer interval.

Permanganate of potash appears to be of very little use. In a solution of 1 to 1,200 of water, equal to one in five of Condyl's Fluid, the larvæ lived for twenty-four hours, and were as lively as ever at the end of that time, while in a solution of 1 to 500, equal to nearly one in two of Condyl's Fluid, they lived for four hours without there being any appreciable effect upon them, and even after twenty-four hours more than half of them were alive.

Hence by treating all *Anopheles* resorts frequently with **Jeyes' Fluid**, kerosene, or gas tar, during the whole of the dry season, when such pools are comparatively scarce, and by paying particular attention to surface drainage in malarial districts, much might be done towards effecting their partial, if not total, extermination.

In conclusion, I think I may safely say that by working upon these lines, and given the services of half-a-dozen intelligent coolies, some one to look after them, and the necessary supplies of the above-mentioned chemicals, in a very short time it would be possible to cause the *Anopheles* to become so scarce in Hongkong that should they prove to be the *only* source of infection by malaria, cases of malarial fever would soon be as rare as cholera, and the finding of the *Anopheles* larvæ in any part of the island as difficult a matter as looking for the proverbial needle in a truss of hay.

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EDITED BY JAMES CANTLIE, M.B., F.R.C.S., AND W. J. SIMPSON, M.D., F.R.C.P.

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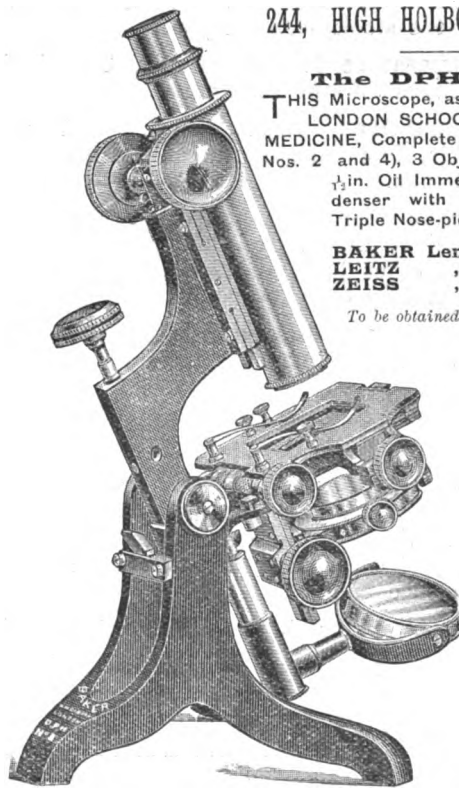
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ments so difficult to obtain abroad, we give a list of names and addresses which we trust will be found
useful to our numerous correspondents and subscribers.

Original Communications.

THE NEW BIOLOGICAL TEST FOR BLOOD— ITS VALUE IN LEGAL MEDICINE AND IN RELATION TO ZOOLOGICAL CLASSI- FICATION¹.

By GEORGE H. F. NUTTALL, M.A., M.D., Ph.D.

*University Lecturer in Bacteriology and Preventive Medi-
cine, Cambridge.*

THE demonstration by me in 1886 to 1888, of the
existence of bactericidal properties in the blood and
other fluids of the body (properties the existence of
which were indicated by the independent observations
of von Fodor), has in the course of the last thirteen
years led to the discovery of other properties, both
natural and artificially produced in the blood of man
and animals. We now know of the existence of
specific bactericidal substances, anti-toxins, agglu-
tinins, hæmolysins, of the formation anti-bodies in the
blood which are capable of neutralising the action of
rennet, and of destroying certain cellular elements
(spermatozoa, epithelial cells). We have learnt more
recently of the existence of precipitins in the blood of
various animals treated with filtrates of bacterial
cultures, the serum of certain animals, milk, pepton, &c.

The chemical nature of these various anti-bodies
is but imperfectly understood. The substances which
bring about the phenomena of agglutination of bacteria,
have been proved to be distinct from the so-called pre-
cipitins. The agglutinins are more readily destroyed
by heat than are the precipitins. Whereas injection
of tetanus cultures into animals leads to the forma-
tion of specific agglutinins, no specific precipitins are
formed. Several of the anti-bodies named may be
found within the body at the same time, for example,
precipitins, agglutinins and hæmolysins may be formed,

as Bordet has shown in the serum of rabbit, which
has been injected with fowl's blood.

The names applied to the various anti-bodies named
are in accordance with their action in vitro or in the
body. The anti-toxins neutralise the particular toxin
with which an animal has been treated, the neutralisa-
tion depending upon anti-toxin and toxin entering into
chemical combination. In the case of the agglutinins,
hæmolysins, and cellucidins, a reaction takes place
which is visible to the eye through the fact that
cellular elements (bacteria, blood-corpuscles) are
clumped, that blood-cells are dissolved, or that cells
are visibly altered and destroyed. The precipitins
bring about a visible reaction, that is a precipitation
in two previously clear fluids, when an anti-serum is
mixed with its homologous serum, or when an anti-
serum is mixed with its homologous culture-filtrate,
provided in the latter case that the blood or culture
injected is capable of bringing about the formation of
precipitins in the body of the treated animal.

The existence of specific precipitins for certain
bacterial products was first demonstrated by Kraus
(1897), who found that when he added anti-typhoid,
anti-cholera, or anti-plague serum to clear culture-
filtrates of the corresponding bacteria, that a pre-
cipitation occurred. Nicolle (1898) confirmed these
observations with regard to cholera and typhoid, and
found that specific precipitins were also produced in
animals by injections with cultures of *Vibrio massauah*.
Subsequently Marmorek found that precipitins were
produced by injections with the *Streptococcus*, and
lately Kraus (1901) has found the same to occur when
animals were treated with cultures of the glanders
bacillus. In all of these experiments, only the homo-
logous anti-sera acted upon culture-filtrates of each
particular germ. Kraus found that the reaction was
not impeded through the addition of antiseptics to
the fluids.

Following upon this fundamental discovery by
Kraus, we find that Bordet (1899) observed the
formation of precipitins in the blood of animals

¹ Abstract of a Lecture delivered at The London School of
Tropical Medicine, November 28th, 1901.

treated with milk. He injected rabbits with milk and found after they had been treated for some time, that their serum contained a precipitin which only produced a precipitation in the milk with which the animal had been treated. Fisch, in the United States, obtained similar precipitins when he injected udder cells into animals. Wassermann and Schütze, who repeated and extended the experiments of Bordet, were able to confirm these. They injected human milk and that of the cow and goat into rabbits, and found that an anti-serum was formed in each case which only produced a precipitation in the particular milk with which the rabbit had been treated. Such anti-sera have been aptly termed "lactosera." By means of the lactosera we are able to distinguish various kinds of milk. The reaction, moreover, proves that different milks are different in chemical composition.

Similarly anti-sera have been produced which act upon solutions of pepton. Whereas Tchistovitch obtained negative results in his experiments, Myers (1900) found that he was able to produce an anti-serum for Witte's pepton by injecting pepton solutions into rabbits. The results of Myers lend support to Ehrlich's view that anti-toxin formation depends upon processes essentially similar to normal physiological processes in the body. If we inject toxins of bacterial origin (tetanus, diphtheria, &c.), or such as have been obtained from certain plants (abrin, ricin, rubin); or again, those derived from animals (snake-venom, scorpion-venom, eel-serum), we in each case obtain anti-toxins which are capable of neutralising their homologous toxins in vitro or in the body. If we inject pepton we observe that a neutralising body to pepton is formed—an anti-pepton. We know from the investigations of Wassermann that tetanus toxin enters into chemical combination with the nervous tissues of susceptible animals, and we know from the work of Neumeister that pieces of intestine are capable of entering into chemical combination with pepton. It seems clear, therefore, that the way in which toxin is taken up and pepton assimilated is essentially similar, and consequently we may assume that the formation of the anti-sera is brought about in a similar manner.

The discovery by Tchistovitch (1899) of precipitins which act upon a serum with which an animal has been treated, was one of far-reaching practical importance. In treating rabbits with eel-serum, which is toxic, he observed that the treated animals' serum acquired specific anti-toxic properties, but that in addition it was capable of producing a precipitation in clear solutions of eel-serum. He observed the same phenomenon when he treated rabbits with horse-serum, and then added their serum to dilutions of horse-serum. Bordet observed similar phenomena when he injected the serum of the fowl into rabbits. The results of Tchistovitch and Bordet have stimulated a number of investigators to take up the subject. Uhlenhuth confirmed the work of the French observers. Leclainche and Vallée (1901) and others were able to produce a specific anti-serum by injecting animals with albuminous urine. Uhlenhuth produced anti-sera, which acted on the bloods of the horse, ox and man, and found that dilutions of dried bloods also gave the reaction on the addition of their

homologous anti-sera. Uhlenhuth examined some twenty bloods and found that none of them reacted to the anti-serum for human blood, with the exception of human blood. Wassermann and Schütze, however, tested the blood of a baboon and found that it gave a similar reaction to that of man, and Stern obtained the same result with the blood from three species of monkey. The latter authors, therefore, conclude that the reaction is not strictly specific in character. My investigations were made prior to the publication of some of the foregoing results and have been confirmatory. I have been able to produce a variety of anti-sera, and am at present engaged in producing a large series of anti-sera, with the object chiefly of studying the zoological, or what I have termed, the "blood relationship" amongst animals.

Whereas previous workers had injected fresh sera into animals for the production of anti-sera, I found that I was able to produce an anti-serum by injecting old preserved fluids, thus, I obtained horse anti-serum by injecting some old anti-diphtherial horse serum (preserved two years and seven months in the laboratory by means of trikresol). Similarly human anti-serum was produced by injections of human pleuritic exudate which had been preserved for seven months with chloroform. The anti-sera in these cases did not, however, produce as powerful a reaction as did fresh sera. I was able to confirm the observation of Uhlenhuth that solutions of various dried bloods were capable of giving the reaction, a fact which Uhlenhuth pointed out to be a matter of considerable medico-legal importance. I furthermore made the interesting observation that a mixture of five or six bloods does not prevent the reaction taking place when the anti-serum for one of the bloods in the mixture is added. The reaction for human blood, for instance, is obtained in a mixture of five or six different bloods on the addition of human anti-serum, or on the addition of any other anti-serum for a blood in the mixture, even when the bloods in the mixture are diluted 1 in 500, or upwards. My observations have since been confirmed by Uhlenhuth and by Ziemke.

Uhlenhuth has found that specific anti-bodies appear in the serum of a rabbit which has been fed on white of fowl's egg, and Moro has shown that when a gravid rabbit is treated with milk, the serum of the offspring may also acquire the properties of a lacto-serum. Uhlenhuth has, moreover, shown that anti-sera may be used in the differentiation of meats. The anti-sera producing a precipitation in meat extract made by means of chloroform water. Even old smoked meats gave the reaction, and just as I found that I could detect certain bloods in a mixture, Uhlenhuth found that he could detect a mixture in hashed meat. Schütze has just shown that an anti-serum may be obtained through injecting animals with muscle albumen. Kowarski, as also Schütze, find that precipitins are formed when vegetable albumens are injected, but we do not as yet know clearly whether or no the anti-sera in the latter case will possess a corresponding value in diagnosing the different kinds of vegetable albumen.

In recent publications which have appeared in the *British Medical Journal*, in the *Journal of Hygiene*, and in a paper communicated to the Royal Society, I

have described the technical methods whereby the so-called specific anti-sera may be produced, and in the paper in the *Journal of Hygiene*, the reader will find the literature on the subject exhaustively treated.¹

The anti-sera are produced briefly as follows: Assuming that we wish to obtain an anti-serum for human blood, we inject human blood intraperitoneally into rabbits. After about five injections, given at intervals of three or more days, the rabbit is bled to death, and its blood-serum collected. The serum of this rabbit will be found to have acquired the remarkable property of producing a precipitation immediately on its being added in small quantity to a dilution of human blood-serum. If allowed to rest, the precipitated substance gravitates to the bottom of the tube. I have now tested upwards of 280 bloods obtained from animals of all classes of vertebrates with such anti-serum for human blood, and have, with the single exception of monkey bloods, obtained negative results throughout. Similarly, if rabbits are treated with the blood of the horse, dog, ox, sheep, monkey, fowl, duck, &c., anti-sera are formed which produce precipitations only in the bloods of the animals whose blood was used for treatment, or, to a lesser extent, in the bloods of nearly allied animals.

In obtaining the anti-sera I have proceeded as follows: After the animal has received five or six injections, some days, usually a week, is allowed to elapse. If a rabbit has been treated, the ear is now shaved and sterilised, and a sample of blood is collected by means of a sterilised bulbed pipette, the blood being obtained from the punctured ear-vein. The blood is transferred from the bulb to a test-tube where it is allowed to clot. The separated serum is then drawn off into fine sterilised pipettes, the ends of which are sealed in the flame.

The bloods to be tested are diluted to a suitable degree, 1 in 50, 1 in 100, or 1 in 200, or more, with normal salt solution, and the dilution is transferred to small test-tubes. Other investigators have repeatedly spoken of the difficulty they have had in obtaining clear blood solutions, having for that purpose to resort to filtration of the solutions through Pasteur-Chamberland filters, &c. I have found a very much simpler method to give excellent results. If I wish to obtain a clear solution of a blood, I simply soak up the blood with pure filter-paper and allow the paper to dry, this, if necessary being greatly hastened by placing the filter-paper in a thermostat at about 37° C. When the dried filter-paper, or a piece of it of suitable size, is dropped into normal salt solution, it almost immediately gives a clear blood solution, particulate matter being retained within the meshes of the paper. If it were not for this simple method I should scarcely be in a position to pursue the extended study of bloods which I have undertaken. I am now obtaining bloods from all parts of the world, the samples having been dried on strips of filter-paper, which are forwarded readily through the post. The collector in each case notes the name of the animal, date, &c., with lead-pencil on one end of the filter-paper which has been

kept clean for the purpose. When paper of fairly constant thickness is used, it is possible to obtain blood-dilutions of fairly uniform strength by cutting out squares of blood-stained paper of a given size and adding a measured quantity of salt solution to them in a test-tube.

Whereas Wassermann noted that he was able to keep his anti-sera for blood testing for two weeks in the refrigerator, I have found that I could keep them for months in sealed tubes, or through the addition of a small quantity of chloroform. The chloroform unquestionably causes a more rapid deterioration in the precipitating power of an anti-serum, but in some cases its use may be very convenient, especially when there has been a chance of the anti-serum having become contaminated. Others (Uhlenhuth and Ziemke) have confirmed my observations with regard to the use of chloroform as a preservative, but they do not state a fact which I have observed, namely that it is necessary, before using it, to drive off the chloroform by placing the test-serum in the thermostat. A small quantity of chloroform in a test-serum will frequently cause it to produce a considerable clouding, which might be a source of error, as the clouding is produced in almost any serum to which the test-serum is added. Some of my test-sera still give a marked reaction after having been preserved for eight months in sealed tubes. From this fact, and the observation that old preserved exudates may bring about the formation of anti-sera when injected into animals, we may conclude that the bodies which bring about the formation of anti-serum, as also the bodies in anti-serum which produce the reaction in vitro, are remarkably stable bodies.

In making the test, I use minimal quantities instead of the larger quantities employed by other observers. The reaction obtained with small quantities of anti-serum are just as convincing as when larger quantities are employed. I place the serum dilutions to be tested in small test-tubes of a calibre somewhat smaller than a lead-pencil and about 4 cm. in length. About 0.5 cc. of the dilution is placed in the tube. A single drop of test-serum is now allowed to fall into the tube containing the dilution, to the bottom of which it sinks. The precipitation should take place almost immediately at the line of contact between the heavier serum and the supernatant blood dilution. I usually consider the reaction negative when no clouding occurs within fifteen minutes. It may occur that a clouding takes place when the tubes are allowed to stand longer, the cloud being produced at times in non-homologous blood dilutions, it is therefore necessary to observe a time limit in making the test.

Tchistovitch found that long-continued treatment of a rabbit with eel-serum lead to the animal becoming immune to its toxic effects. He also observed that the precipitins disappeared during prolonged treatment. I have observed the same to take place in rabbits treated for longer periods with human serum. There is therefore a point in the treatment of animals, where, for purposes of obtaining an anti-serum, a maximum of power is reached, and the animal should be bled. This can be determined by periodic bleedings from the ear-vein, and tests

¹ *Brit. Med. Journ.*, vol. i. (May 11th, 1901), p. 1141; vol. ii. (Sept. 14th), p. 669; *Journ. of Hygiene*, vol. i. (July 1st), p. 367-387; *Trans. Royal Soc.*, Meeting of Nov. 21st.

repeated in the manner described above. When an animal yields a sufficiently powerful anti-serum, I bleed it to death by cutting its throat and catching the blood in a sterile vessel, the animal's throat having of course been previously shaved and sterilised.

The precipitum, as I shall in accordance with the suggestion of Myers term the body which is precipitated by adding an anti-serum to a blood dilution, certainly requires further study. Mr. Hopkins and I are at present engaged in studying its chemical properties, and our results will be made known in due course. The precipitum, as Tchistovitch showed, is soluble in dilute acids and alkalies, insoluble in water and solutions of alkaline carbonates and neutral salts. A precipitum is only formed in alkaline solutions. Heating the serum to 56° to 60° C. has little or no effect upon its power to produce the reaction. Nolf has shown that precipitins may be produced as the result of injecting purified serum globulin; injections of washed blood-corpuscles produced no precipitins.

In choosing an animal for the production of an anti-serum, we must not forget that in some cases the result may be negative. For instance, Bordet found that when guinea-pigs are treated with rabbit-serum no anti-body is formed, and Nolf made a similar observation on pigeons treated with chicken blood. Naturally the choice of animals will largely depend upon the convenience of keeping the animals in the laboratory. The rabbit has for this reason been the animal most frequently chosen.

I have tested the bloods of twenty-two species of monkey, which include members of the four known families of apes, and finds that they all react to the human anti-serum, but none of the other 280 bloods gave a similar reaction, amongst these bloods being those of two species of Lemur. The blood of the New World apes (*Hapalidae* and *Cebidae*) gave less reaction than that of the *Cercopithecidae* and *Simiidae*. The blood of *Hapalidae* gave no reaction with weak human anti-serum. On the other hand the blood of *Simiidae* (ourang-outang, chimpanzee) appeared to give about as much reaction as human blood. My tests having been made with dilutions of dried bloods did not, however, permit of exact conclusions with regard to this similarity between the blood of *Simiidae* and man. Dr. Grünbaum, of Liverpool, however, informs me that the amount of reaction obtained by him with these bloods was practically indistinguishable from that obtained with human blood, either in quality or quantity. He has prepared gorilla, ourang, and chimpanzee anti-sera, and finds that they not only react with their own blood, but also with each other, and also upon human blood.

If, for the time being, we exclude the *Simiidae*, we may expect that anti-sera for the other monkey bloods would enable us to differentiate their blood from that of man, for the reason that human anti-serum would give a more marked reaction with human blood than it does with monkeys' blood and *vice versa*. If we may accept the degree of blood reaction as an index of the degree of blood relationship between the *Anthropoida*, then we find that the Old World apes are more closely related to man than are the New

World apes, and this is exactly in accordance with the opinion expressed by Darwin.

It is safe to say that the new blood test is capable of medico-legal application for the detection of blood stains. We have a good deal of experimental observations on this head from different workers. I might casually mention that I have obtained a perfectly characteristic reaction with human blood which has been putrid for two months. Uhlenhuth and others have made many similar tests, and have obtained positive results in some cases with blood stains several years old. In some cases these blood stains are difficult to extract, and in such cases Uhlenhuth finds it better to extract with 0.1 per cent. soda solution instead of normal saline.

With dog anti-serum only six out of the 280 bloods gave a positive reaction, these bloods being those of other species of *Canidae* (foxes, jackals, wolf). Horse anti-serum only produced a reaction in donkey blood dilutions, no other equine bloods being tested. Anti-sera for ox and sheep blood gave positive though less marked reactions with the bloods of other true ruminants. It is interesting to note that the bloods of *Tragulidae* and *Camelidae* gave no such indications of blood relationship with the true ruminants. The anti-serum for fowl's egg albumen produces but a slight reaction with dilutions of fowl's blood, when a great amount of precipitum is produced in solution of fowl egg albumen.

To conclude, we have a very delicate test in the anti-serum for bloods, a test which will have its use in legal medicine, and which will permit of our studying the relationships between animals. It is a very remarkable fact that a common chemical property has persisted in the bloods of the *Anthropoida* throughout the ages which have elapsed during their evolution from a common ancestor, and this in spite of differences of food and habits of life. Similarly the blood-relationships existing between other groups of animals serve to carry us back into geological times. I believe that by means of these studies on the blood we shall have most valuable aid in the study of various problems of evolution.

I shall be exceedingly indebted to any reader of this paper who will aid me in this investigation, through collecting specimens of blood when occasion arises, and I shall be happy to forward a blood-collecting outfit to those who will favour me with their addresses. The "outfit" is simplicity itself, for it only consists of slips of filter-paper contained in paraffined covers, together with brief directions on how to take the samples.

P.S.—In recent papers by Uhlenhuth, that author takes to himself the credit of having discovered the test for blood above described. Uhlenhuth, as a matter of fact, has discovered no new principle. He only followed the lines laid down by Tchistovitch, Bordet, and Myers. It is true that he was the first to obtain an anti-serum for human blood, and that he proved that the reaction took place with solutions of dried blood, &c., but he is totally unjustified in taking the credit of the method to himself, especially as he is evidently perfectly *au courant* with the literature of the subject.

NOTE ON RECOVERY FROM TEMPERATURE OF 110° F.

By JAMES CANTLIE, M.B., F.R.C.S.

IN an article on "Siriasis" in the *Lancet* of June 12, 1901, Mr. A. E. Griffin remarks that "it is interesting to note the recovery, after a temperature of 108·6° F. Gihon states that there had been only two cases of recovery when the temperature had reached 109°, and seven when 108° and over had been registered, out of the several hundreds of cases recorded in America."

In reference to this matter it is worthy to place on record a case of high temperature which occurred in a patient of Dr. Wm. Hartigan's, in Hong Kong. A man, over 50 years of age, engaged in superintending harbour works, developed a high temperature about 10 o'clock in the morning. The temperature quickly rose, and when Dr. Hartigan saw his patient the thermometer registered 110° F. Dr. Hartigan was dubious as to the correctness of the thermometer, but on testing it subsequently it was found to be perfectly reliable. When the writer saw the case some forty minutes afterwards with Dr. Hartigan the temperature was then 108·2° F., although the patient was, and had been, perspiring freely, and although his body was wrapped in wet sheets and was being rubbed with ice. The patient seemed by his appearance to be beyond recovery when the temperature was at its highest, but yielding to the treatment energetically pursued by Dr. Hartigan, the temperature rapidly fell, and in two hours after attaining its maximum the temperature dropped to 102° F. The patient recovered completely, and in a week or so was about again.

In my own practice the highest temperature recovered from was one of 107·6° F. The fever seemed to defy all the usual methods of treatment, and it was only when 6 grains of antipyrin were administered hypodermically that the temperature began to fall. It fell rapidly, and the patient was soon about again. This case occurred in the year 1888, in Hong Kong, and as far as I know was one of the first cases of hyperpyrexia treated by injecting antipyrin hypodermically. Of temperatures in "heat stroke," combined with alcoholism, I have seen five over 110°, namely, 110·4°, 111·0°, 113·4°, 112·0° and 111·5°. All these cases died in a few hours. I tried bleeding from the arm in two cases but too late. Were I confronted with such cases, again I should bleed early, and if the flow of blood from the arm veins was unsatisfactory, I should aspirate the liver and draw off ten to twelve or more ounces of blood from that organ.

TURPENTINE IN PARASITIC SKIN DISEASES.—Dr. L. Leven employs applications of oil of turpentine in the treatment of pityriasis versicolor and tinea tonsurans. In the first affection a cotton pledget is soaked in turpentine and vigorously rubbed on the diseased skin. This is done once daily. If the lesions are extensive, only small areas should be thus treated at each sitting. For the second disease the author recommends the use of compresses soaked in turpentine and applied to the affected areas morning and evening. The good results show themselves in a very short time.—*La Sem. Méd.*, vol. xxi., No. 8.

British Medical Association.

(Continued from p. 399.)

SOME POINTS CONNECTED WITH HUMAN FILARIASIS.

By J. EVERETT DUTTON, M.B. Vict.

Walter Myers Fellow, Liverpool School of Tropical Medicine.

THE remarkable fact that the embryos of filaria Bancrofti, after reaching a certain stage in their metamorphosis in the body of the mosquito, tend to travel and collect in the proboscis of that insect, has attracted a good deal of attention among the students of tropical parasitology, and has opened up a new era in the etiology of filariasis.

It is interesting and worthy of note that this observation has been recorded by workers in many parts of the globe. Low¹ demonstrated the young filariæ in the proboscis in sections of *Culex ciliaris* obtained from Australia.

James,² in India, showed that in *Anopheles Rossii* the embryos of filaria Bancrofti were capable of development, and in the latter stage of metamorphosis eventually reached the labium of the proboscis.

The members of the Liverpool Expedition to Nigeria³ in West Africa have recorded similar observations working with *Anopheles costalis*; and lastly, Grassi and Noc⁴ have traced the development of the embryo of filaria immitis of dogs in *Anopheles maculipennis* to its final stage, which is found in the labium of the proboscis of that insect; from this position they have shown that the young filaria passes into its definitive host when the insect bites.

It is to the question of transmission of the filaria Bancrofti to man by means of inoculation during the act of puncture of the skin by an infected mosquito, that I wish to draw attention. Many observers have repeated Manson's now classical work on the development of the embryo filaria Bancrofti in certain species of gnats, and it has been ascertained that many species of *Anopheles* and *Culex* are capable of acting as intermediary hosts for this parasite. Manson's original hypothesis that the young filaria after metamorphosis in the body of the mosquito, were, on the death of that insect transmitted to water or other medium, and from thence to man, was held as probably correct until Low, last year, found young filariæ in sections of the proboscis of infected mosquitoes, and put forward the possibility of man becoming infected by the bites of these insects; previously Bancroft,⁵ in 1900, suggested that the young filaria nocturna, by making an independent passage for itself into the œsophagus of the mosquito, might pass down the proboscis into the human skin.

During the stay of the members of the Liverpool Malaria Expedition in Nigeria experiments were undertaken to study the life-history of filaria Bancrofti in its intermediary host. On dissection of specimens of *Anopheles costalis* which had been caught in native huts many were found to be infected with filaria (6 per cent.), nearly all the stages described by Manson were observed, and it was noted in a few specimens after teasing the thoracic and abdominal tissues no filariæ

were seen; yet on dissection of the head, large, fully-developed forms, very active in normal saline were discovered. Thinking that these young filariæ were probably filaria Bancrofti, and that this mosquito might therefore act as a host to the parasite, specimens of this species hatched from the pupæ were fed on cases of filaria nocturna every other day at 11.30 p.m., three to six times in all. The experiments at Old Calabar failed, but at Bonny more success was attained and the stages in the development of the young embryo were observed. On August 4th, four mosquitoes remained out of a batch fed on a case of filaria nocturna for the first time fifteen days previously; one of these mosquitoes was found dead in the cage, this was dissected and in the labium a long filaria which appeared to be partly macerated was found. A mosquito was then taken from the cage and killed with chloroform, placing a needle through the thorax, the labium and maxillary palps were pulled away from the base of the head and stylets by gentle traction with the finger-nail placed on the tip of the proboscis. In this way the exoskeleton of the labium was separated, leaving its two trachea and nerves attached to the head; on placing the dissection under the microscope, from the loose connective tissue left behind a long actively moving filaria was seen to escape. The worm lived one hour in normal saline. It measured 1.006 mm., and 0.023 mm. broad. It tapered slightly to each end. At the anterior end, which was rounded off, the cuticle was thickened to form a few very small papillæ displaced round the oral orifice, which was terminal.

The posterior end, which was also rounded off, was provided with four papillæ which arose almost at right angles to the axis of the body of the worm; the anus appeared terminal. The alimentary canal could be seen to run straight down the worm and showed no differentiation into œsophagus and intestine. Besides the alimentary tube two other tubes could be seen, which were, for the most part, straight, but at one or two points were seen to twist round the intestine. Towards the head end, at a distance of 0.14 mm. from the anterior end, there was an indication of the presence of a genital orifice, towards which the reproductive tube was seen to bend.

It is remarkable how far advanced in development the embryo had become. In fact, as shown above, nearly all the organs seen in the adult filaria Bancrofti could be traced, even sex could be distinguished; the worm thus resembled the adult form found in the lymphatics, only on a small scale, though retaining its four-lobed tail, no doubt a valuable aid in progression along the labium. In this connection it is interesting to note that among some new species of bird filariæ having hæmatozoal embryos described by the members of the expedition to Nigeria,⁶ many immature adults were found in the tissues, and were very similar in structure to the young filaria nocturna as seen in the mosquito's proboscis. That the structure of the young filaria at this stage of its metamorphosis should so closely resemble the adult would tend to negative the idea of an independent existence in water or other medium.

It is extremely probable that the filariæ on reaching the proboscis lie extended in the loose connective

tissue of the labium, and are not free amongst the stylets as Low⁷ thought he had seen, although his illustrations represent them as lying in the labium. James⁸ states he found a filaria on two occasions stretched out lengthwise within the tissues of the labium of the proboscis; from his drawing he clearly indicates the filaria in the labium.

Grassi and Noe⁹ state definitely that the larvæ of filaria arrived at maximum development, progress towards the head, and collect there rapidly in the prolongation of the general body cavity within the labium.

It has been shown that the members of the expedition to Nigeria also found the filaria in this position after fifteen days from the first feeding on a case of filaria nocturna; the question now arises, how do the filaria escape from the strong chitinous case of the labium?

Grassi and Noe¹⁰ believe that, owing to the bending of the labium stuffed with filaria, when the mosquito pierces the skin with the stylets, the rupture of the integuments at the bend made in that organ near its centre is brought about, which allows the escape of the filaria along its dorsal groove; in some specimens they believe they have seen the rupture after the escape of the filariæ.

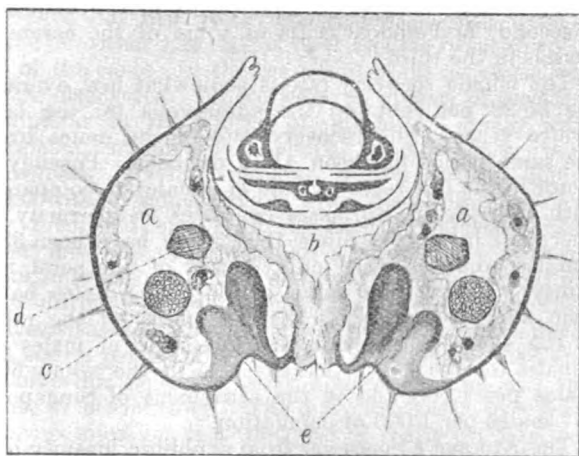
That such a rupture in the chitinous exoskeleton could take place appears somewhat extraordinary; and, furthermore, if one considers the position of the filariæ inside the labium, it would appear a difficult matter for the filariæ to escape, even if such a rupture as described by the Italian observers took place.

Now, the young filariæ in the stage found in the proboscis measure nearly half the length of the labium in *Anopheles costalis*. Supposing for the moment that the worm was situated in the distal half, then, to escape through the rupture occurring about the middle of the labium, it must either turn round—a supposition in itself very unlikely owing to the small internal width of the labium (about 52 μ by 29 μ)—in the distal half, which practically only admits of the presence of two filariæ; or it must emerge tail first, and would then have to travel some considerable distance to reach the skin.

Neglecting, then, for the moment the preceding hypothesis with regard to the escape of the filaria from the labium, the question arises, is there any loophole in the anatomical structure of the labium whereby their exit would be facilitated?

The labium, the largest of the mouth parts of the proboscis, is a rounded cylinder of chitin, lined with delicate connective tissue, and containing a pair of nerves, two large trachea, and a pair of muscles arising from its lateral surfaces. Externally it is covered with hairs and scales, except on its superior surface, which is of smooth, thick chitin, depressed inwards to form an oval channel in which the stylets rest. To the extremity of the labium are attached by true joints (pointed out by Dimmock¹¹), two conical organs, the labellæ, convex on their outer surfaces, and hollowed out on their inner approximated surface; on these latter, from definite areas above and below project specialised hairs; centrally these surfaces are ridged and furrowed, and enclose the tips of the stylets and the tip of the labium proper.

This latter structure is very delicate, and is formed by the continuation of the upper chitinous surface of the labium, which gradually narrows to a blunt point covered with minute hairs. In a transverse section of the labium at its junction with the labellæ (see fig.) three areas can be made out; two lateral pear or kidney-shaped areas, the inferior broad rounded extremities of which are approximated towards the medium line; these areas articulate with the base of the labellæ. Between the pear-shaped areas is a roughly triangular region, bounded above by the stout band of chitin forming the upper surface of the labium, and on which the stylets rest, and on either side by the two lateral regions of the labium. This area is occupied by a very delicate loose membrane covered with very fine hairs; it is easily torn, and is rather difficult to see under the microscope owing to its transparency.



TRANSVERSE SECTION OF PROBOSCIS OF *Anopheles costalis* AT LABELLAR JOINTS.—(a) Lateral pear-shaped end of main body of labium; (b) triangular region. Above (b) chitinous surface of tip of labium; below, loose membrane; (c) nerve to the labella; (d) tendon to labella; (e) regions of labellar joints.

Above it is prolonged under the tip or tongue of the labium and blends with the lateral free edges and apex, whilst laterally it is in intimate connection with the labellar joints. This region appears to be the weak spot in the chitinous exoskeleton of the labium. It seems probable that this membrane would allow of play, and would be stretched when the labellæ are applied to the surface of the skin in the act of biting by the mosquito, and, further, it is not difficult to imagine the young filaria or filariæ abutting against it would further stretch and so cause its rupture, if indeed they were not able to rupture so delicate a structure by their own exertions. It is to be noted that this region is in very close relation to the skin when the mosquito draws blood, so that the young filaria would, if set free by the rupture of the membrane, be practically over the point of puncture of the epidermis; at the same time it would be protected from injury by the tongue of the labium when the stylets are about to enter the skin. The bending at the base of the proboscis, which gradually travel forward to the middle of the organ as the stylets sink

deeper into the skin, would, in my opinion, tend to urge forward the filaria.

Manson¹² has suggested that the young filariæ can apparently discriminate between flesh and vegetable; he states "some mosquitoes fed on bananas had not been deceived into passing into so inhospitable medium, for up to forty days after the insect was infected, and after many meals of banana, they could be found coiled up in the head and stretching along the proboscis."

Grassi and Noe,¹³ in a footnote to their paper on the "Propagation of the Filaria of the Blood exclusively by means of the Puncture of Peculiar Mosquitoes," state that "a great quantity of *Anopheles*," certainly infected within the labium on August 5th, submitted to a fruit diet presented the labium on August 13th completely empty."

It would appear from these facts that the filariæ may pass sometimes from the proboscis into vegetable substances.

From the investigations of the members of the Liverpool Expedition to Nigeria¹⁴ on the bionomics of *Anopheles*, it is very probable that the female mosquito lives on blood alone, in fact, in the case of *Anopheles costalis*, and *Anopheles funestus*, blood is required at least every other day for the maturation of the ovary and the regular deposition of eggs, a process which was carried on in the case of some *Anopheles* under observation for nearly two months; there can, therefore, be no very great risk of the young filaria being lost in a fruit diet.

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SOME REMARKS ON ASYLUM PRACTICE IN SINGAPORE.

By W. GILMORE ELLIS, M.D.Brux., M.R.C.S.
Medical Superintendent, Government Asylum.

ON arriving here in 1888 to take up my post as Medical Superintendent it seemed to me that I had gone back a hundred years at least. No case books; no medical journals; no *post-mortem* records. A register did exist, but the names of patients were unknown; the register and the numbers of the patients agreed, but that was all. There was a palatial asylum, badly drained and worse ventilated, mostly built in blocks of ten single rooms. Instead of one single room to about ten beds in dormitories,

the opposite condition prevailed. Fixed bedsteads were placed throughout immediately below barred windows; proper supervision was difficult; and the Chinese patients, a most suicidal class, were prompt to avail themselves of their opportunities. Strait-jackets were in evidence, and all criminal lunatics and lunatic criminals were in leg irons. Added to the above, one had to contend with quite a babel of tongues, for four dialects of Chinese, Malay, Tamil, Hindustani, and Javanese were commonly spoken; and Burmese, Japanese, Siamese, Annamite, and several different Eastern Archipelago islanders, speaking but their own language, were all represented in the 200 odd patients I found awaiting me.

Descriptive rolls sent by the police with new patients are in many instances wrongly filled up, the answers in no way applying to the questions. The majority of the cases are wandering lunatics in, as is to be expected, the poorest of physical condition, and about whom no history can be gleaned. Relations they may have, but in China or India or Java and the many islands of the Archipelago, immigrants from which make up most of our population. But little can be done that is reliable in the way of elucidating the causes of insanity in such patients. The study of the mental characteristics of uneducated and semi-savage races is most difficult, and before any useful work can be done it is absolutely necessary that a thorough knowledge of their mode of life, their normal mental state, their theories as to witchcraft, ghosts, and dreams, and their folklore be gained. As has been noticed in India, so here, the majority of patients belong to the lowest classes, with minds unable to grasp the relations of cause and effect except in the customary affairs of life, and so constituted that anything outside their practical knowledge is, as a rule, given up as being incomprehensible.

In our admissions there has been and is a marked absence of the more acute forms of insanity, and that most prevalent appears to me but an exaggeration of a low standard of intelligence, passing fairly rapidly into a condition of dementia from which recovery is not infrequent. Again, many are admitted in a state of dementia—dull, obtuse, and indifferent to their surroundings—without having suffered from any previous acute mental disorder; here recovery also is frequent.

Delusions and hallucinations are of a far simpler character than those met with in European asylums; the former are but rarely persisted in to any extent, and the latter worry the patient but little.

All coolies—Chinese, Tamils, Malays, and Javanese—thoroughly believe in witchcraft, and a large percentage of my patients upon recovery assign this as the cause of their insanity. It is necessary to bear this in mind, especially when examining new admissions, otherwise the, to them, normal belief might be considered a symptom of insanity.

Cases of melancholia are somewhat rare, and never very acute. The theory held by some that mania is due to some disturbance of the lower developed portions of the brain, whereas melancholia is due to an affection of a later development, is hereby borne out. Dr. Greenlees finds a similar condition prevailing amongst his native patients in South Africa.

General paralysis of the insane is rarely if ever seen amongst Asiatics. With about 2,600 admissions during my thirteen years' residence in the East I have never seen a case, and it is not to be wondered at when we consider the simple life of the natives, their few or no worries, and the fact that there is no struggle for existence amongst them in the Straits Settlements. In a country where there is no cold, but little indulgence amongst natives in alcoholic excess, where food and lodgings are cheap, and the least possible clothing is required, a disease originating in anxiety, mental worries, and great excesses is little likely to develop. I have had three cases in whom there were some symptoms, both physical and mental, of general paralysis; in none of them did these symptoms advance, nor was the sequence of events such as is seen in that disease. Eventually the cases were considered syphilitic, and the diagnosis was verified *post mortem*, a diffuse gummatous deposit in the pia being found in one case, nodes and ostitis of the vault in a second, and endarteritis of some of the cerebral vessels in the third.

The female recovery rate is somewhat low, averaging 35.29 per cent. on the admissions for the last twelve years. The recovery rate of the males over the same period has been 41.10 per cent. Possibly a factor in the low recovery rate of females as compared with the rate in European countries is the rarity of puerperal insanity. Since 1887 there have been 389 females admitted with only 1 case of puerperal insanity. During the same period 2,330 males have been admitted, showing the peculiarity of the ratio of the sexes in the Straits. The ratio of males to females in the census just taken is in the colony 662 males per 1,000, and in the settlement of Singapore 747 males per 1,000 of population.

The average admissions from syphilitic insanity has been for the past few years 6 per cent., and considering the abnormal ratio of our sexes, the fact that prostitution is considered no disgrace by the Chinese who form the large majority of our population, and above all the abolishment of the Contagious Diseases Acts, it is not to be wondered at. Many, unfortunately very many, of our admissions besides the above, show signs of present or past venereal disease, but in them the disease is probably not the cause of their insanity.

Cases of malarial insanity are not uncommon. The insanity from this cause is usually most acute, quite distinct from delirium, usually of but short duration, and nearly invariably results in recovery. It has been rare for these patients to have any relapse of fever whilst under asylum treatment. I have the notes by me of 36 cases. Of these three have died, one from acute dysentery, one from pulmonary tuberculosis, and one from heart disease. The remaining 33 have all been discharged recovered. All were admitted noisy, dirty, violent, and destructive—temperature normal. From a few days to a fortnight after admission they became quieter, in fact, many of them became somewhat stuporous and were fed with difficulty. From this condition they quickly recovered and 29 were discharged in from three to four months. The other four, three of whom had relapses of fever and insanity with delusions and hallucinations, were

discharged recovered, two in eight months, and two in from ten to twelve months. Careful blood examination showed nothing abnormal except in the relapsed cases. May not these cases be due to some substance in the circulation, and may not that substance be some product of the malarial parasite? Our knowledge as yet does not take us very far on this road, and the causes of such insanity, as above described, are, in their very nature, most difficult of detection.

Opium smoking, a common indulgence in this part of the world, has been stated by many, most of whom I should imagine to be entirely unfitted to judge, to be a frequent cause of insanity. This statement I cannot but impugn. Of about 2,600 patients whom I have admitted, opium smoking was said to be the cause of the insanity in 30. I have most carefully inquired into the history of these cases, but few of them were the emaciated opium sot—in fact, one rarely sees that being in Singapore—all had been confirmed opium smokers, but usually in moderation. I was able to make out other causes for their mental breakdown in 22 of the cases; in the remaining eight no cause was to be discovered. There were no special or peculiar symptoms in their form of insanity. Some were maniacal, others melancholic, and others were demented. Asylum patients broken of the opium habit without much trouble when first admitted, having recovered and been discharged and readmitted after intervals of more than a year, upon recovery from their second attack of insanity, have assured me that during the whole time they were outside they had not smoked a single pipe of opium. I have never yet seen a person of whom I could believe, or had any grounds for believing, that opium smoking was the cause of his insanity. The morphine habit, by subcutaneous injection, is a weakness of many Chinese, but none addicted to this habit have as yet found their way into my hands. There is a Chinaman, whom I saw lately in the prison, who shows on back and arms the scars left by many years' indulgence in the habit. He has always been quite sane, and is at present free from any craving for the drug.

The food question in an Eastern asylum is very important. Mohammedans will not eat food from a kitchen where food for Chinese has been cooked if they have the least glimmering of sense left, and Hindus will not touch food cooked by a lower caste man. Cases of refusal of food therefore must always be inquired into in detail, and not at once considered as a symptom of the patient's insanity.

What amusements to try and forward is a great difficulty, there being none of an active character so useful as aids to recovery with Europeans that I can discover attractive to Asiatics. A few play a game resembling draughts, all smoke, and a few appreciate an occasional theatrical or conjuring performance.

Native attendants are not very trustworthy nor sensible, as we understand the word. An amusing incident, which might have turned out seriously, happened in my early days in the East. The night attendant in charge of the infirmary block, who up to that time kept the key of the dispensary at night, was attacked with diarrhoea at 12.30 a.m., and attracted the attention of a Tamil imbecile named Tamby, who was sleeping in the block. Tamby was employed

daily in carrying the medicine basket around the asylum with the dresser, and, with the knowledge of drugs thus gained, imagined himself capable of treating the attendant beneficially. At his request the attendant handed him the key of the dispensary, from whence he brought out something to give his patient. The attendant at first demurred to taking it, but was persuaded by Tamby offering to take half. One-half was taken by each, and the attendant, immediately feeling very ill, was just able to call up the assistant medical officer before falling down in convulsions, Tamby being found in a similar condition. Both were seriously ill for forty-eight hours, but rapidly made uninterrupted recoveries. The above manner of obtaining the medicine was described by the attendant; Tamby denied having entered the dispensary, or having taken anything, and accounted for his symptoms by fright caused by a big black cat rushing by him. I believe chrysophanic ointment to have been the drug taken, and, from the attendant's description, probably about 60 grs., equal to 3 grs. of the acid. I have not gone into the details of their symptoms, but they were not quite those of any poison described in the text-books.

I have written on the subject elsewhere, but it may not be altogether out of place to make a few short remarks upon that mental condition, practically peculiar to the Malay race, the culminating point of which is commonly called "amok," and is a state of blind and furious homicidal mania, several cases of which have come under my notice during the past ten years. Fright, grief, a grave disease, brooding over real or imaginary wrongs, the sight of blood, malarial fever, and a peculiar condition of nervous depression, have all been noted as exciting causes. It may be that in some cases the individual wilfully works himself into a condition to amok; in others undoubtedly he passes into that condition insensibly and suddenly. The question for us is how far he should be held responsible for crimes committed when running amok. As in persons suffering from epilepsy, strong emotions will bring on a fit due to disturbances in the motor portions of the cerebral cortex, so I believe that in some Malays strong emotions cause a disturbance in the sensory portions of their cerebral cortex, the result of which is an unconscious paroxysm of homicidal mania, or, as Maudesley calls it, an "epilepsy of mind." During this paroxysm the unfortunate individual will rush through the most crowded street or village, stabbing right and left, at man, woman, or child, relation, friend or stranger. After such an outbreak nothing is remembered that took place during it, the usual explanation on the part of the individual being that the head was giddy, and that everything appeared red, or dark, or like blood to the eyes. All men that I have examined after having run amok, at periods varying from a day to a few weeks after the incident, had a wild furtive stare, showing much sclerotic, and, when questioned as to the amok, their respirations became hurried and their pulse quickened as they gave the above explanation, or answered, "I don't know," "I can't remember." They remember that they were depressed, that they were upset, that they suffered from grief—in fact, that their affective nature was at fault, but nothing more.



A CASE OF MULTIPLE FIBROMATA IN A NATIVE OF INDIA.

By T. FREDERICK PEARSE, F.R.C.S.Eng.

The accompanying illustration shows a case of Multiple Skin Fibromata in which the greater part of the body was covered by these curious swellings. They were of various sizes ranging from a pea to a small orange, and some were rounded, firm, and tough, while others were soft and elastic. They were all freely moveable. The majority were sessile, but a few were pedunculated. The subject was a Mohammedan native of India, aged about 40 years. He said that he had had these tumours more or less since he was ten years of age, and that his mother was similarly afflicted. The cause is put down to a burn. It is worthy of note that there are comparatively few on his legs, but on his head, trunk, and upper limbs the skin is almost completely occupied with them. In addition he has a tumour the size of a small cocoanut at the back of the right hip, freely moveable, distinctly circumscribed, smooth, but very hard. This he had had almost as long as the skin tumours. There is not the slightest appearance or condition to suggest that these tumours are connected with the lymphatics, and the entire absence of pain or tenderness as well as their very extensive distribution, viz., involving nearly every inch of skin surface, is surely against their association with nerves. The man's general health appears good.



not very large during these two years for this class of native.

The present detachment used the zinc-contaminated water from their first arrival in March, 1900, until the end of the year, when its use was forbidden and prevented. After its use was stopped the number of patients steadily decreased. There have been no new cases of this kind, and the general health has much improved.

In 1900 colic, diarrhœa, and a spurious form of dysentery were persistently complained of. The health had never been affected in this way before, as the following records of attendance for this class of case, taken before, during, and after using this water supply, will prove :—

From March to October, 1898, 30 men were under treatment for this class of case; in 1899, for the same months, 58 patients; in 1900, during the same period, 219 men, and, at the close of the year, it was found that 43 different individuals out of the 56 had been on the sick list on account of gastro-intestinal disorders. Nine men and one woman had been transferred on medical certificate. One patient was recommended for four months' sick leave to India; 5 others, who had constantly been on the sick list, took all the leave which was due to them; 7 voluntarily left the service on the termination of their agreements on account of ill-health, and one of them subsequently died in Selangor. Another died at Kuala Lipis. The spirit of the remaining 31 men of the original Perak detachment was broken, and the general loss of tone was very noticeable.

During 1900—from January till April—only 22 have been treated for these complaints, and the figures are very striking when it is remembered that out of these 22 cases many have been old patients from 1900.

A brief clinical account of six cases typical of the prevailing sickness in 1900 is here given :—

(1) P. S., aged 25, lance-corporal, Sikh, had been an out-patient during April for "colic," was admitted to hospital on May 10th, 1900, for "dysentery," remained sixteen days, and was discharged; but was readmitted on June 30th for diarrhœa and colic, suffered from vomiting and violent retching. The vomited matter was sometimes streaked with blood. He was placed on milk diet and recovered, but was again admitted on July 30th for dyspepsia and anæmia; returned to duty, but was readmitted for the fourth time on October 3rd, and was subsequently transferred to Selangor very much reduced in weight and strength.

(2) A. S., aged 25, private, a Pathan of powerful physique, was first treated as an out-patient for diarrhœa at the commencement of June, 1900; was admitted to hospital on June 28th, remained eight days on milk diet, recovered, and was discharged, but readmitted on July 24th for diarrhœa. He remained ten days, and recovered on milk diet. On October 25th was readmitted for "dyspepsia" very much prostrated in strength, and was transferred to Selangor after two months in hospital. This man's weight was taken on October 1st, 1900; it was then 129½ lbs.; again on October 15, 126 lbs.; again on October 31st, 123 lbs.

(3) V. S., aged 27, private Sikh, a fine soldier of good physique, was admitted on June 22nd for "dyspepsia" and "diarrhœa." Previous health bad, as he had been an out-patient for some time; suffered from stomatitis. He was readmitted on August 28th, and died on September 27th, 1900. He persistently complained of pain referred to the region of the stomach, suffered from violent vomiting and diarrhœa, and became much emaciated. The muscles of the calves and thumbs were notably atrophied; he had no fever and no cerebral symptoms, and died of inanition. No *post-mortem* examination was practicable.

(4) S. S., aged 27, bugler, Sikh, a young soldier, had been an out-patient for two or three days in March, was admitted on June 18th for dysentery; was readmitted on October 5th for dyspepsia. He complained of colic, diarrhœa and vomiting, and also had slight hæmatemesis. Progressive loss of strength and flesh was very marked. There was no physical signs of disease. Worms were suspected, and he was given castor oil and santolin without result. On December 3rd this man's weight was 106 lbs.; on the 12th 101 lbs.; on the 28th 98 lbs. He was given alcohol and cod-liver oil without benefit, and was subsequently transferred to Selangor.

(5) P. B., aged 23, private, a well-built Pathan, had been treated as an out-patient for colic and dyspepsia, was admitted to hospital for diarrhœa on August 1st, 1900, discharged as cured after six days; had been placed on milk and rice-water diet. Readmitted on December 31st for "dysentery," thin, emaciated and very anæmic in appearance; general febrile disturbance; griping pain in stomach; stools frequent but not offensive; contained ropy mucus and blood. Was given phosphate of soda in 4-drachm doses three times a day. He recovered and was discharged in thirteen days, but readmitted on February 15th, 1901, for general debility. General loss of flesh, but no cramps or anæsthesia was complained of. Blood poor in quality on microscopical examination; chemical examination of the urine for zinc negative.

(6) G. S., aged 26 years, private, Sikh, had been an out-patient since May 10th with "dysentery." Was admitted to hospital on May 13th for melæna, remained in the ward for five days, and recovered on milk diet; was supposed to have had ulcer of the rectum. Readmitted on October 9th with diarrhœa and melæna, recovered again in five days, but has been under treatment as an out-patient for anæmia.

This man as well as the foregoing patients was very anæmic.

Special points of interest in the clinical histories are :—

(1) The fact that gastric symptoms predominated over nervous symptoms. It is difficult to offer any satisfactory reason as to why this should have occurred, except that it is a common experience in the East that Sikhs suffer greatly from irritative dyspepsia even under ordinary circumstances, and are not often attacked with neuritis. As far as my experience in Pahang goes, they have been notably exempt from the prevalent form of peripheral neuritis which is very commonly met with in *beri-beri*.

(2) The fact that all the Sikh patients had had their

diets prepared at the barracks, and had their drinking water supplied from the contaminated tank all the time they have been in the wards. This was on account of their religious custom, which forbids them to use food prepared by others than their own nationality, or to drink water unless it has been carried by a Sikh. The Pathans, on the other hand, being Mussulmans, were supplied with the ward diets and water by the hospital cook, who is a Mohammedan. They were also accustomed to eat and drink with their Mohammedan friends in the town, but the Sikh soldiers had few opportunities of feeding outside barracks. The hospital returns show that the Sikh soldiers suffer in a proportion of almost 2 to 1 as compared to the Pathans.

(3) The slow and deadly action of zinc poisoning by administration in small but continuous doses was well exemplified. In some cases it seemed to suggest the possibility of zinc being an accumulative poison. Emaciation was, generally speaking, an evident symptom, and was so marked in the case of V. S. as to suggest malignant disease of the stomach at the time of his death.

With regard to the chemical analysis of the water, it is necessary to say that the samples A and B mentioned in the analyst's report were taken from the Pathans' tank. It was not possible at the time, owing to a short drought, to send Mr. Burgess samples from the Sikhs' tank. An excess of zinc was found in this water by me as compared to the other. For the same reason it took some days to collect the sample C, which was taken directly from the roof. The surface of the corrugated iron were not flushed with rain as is usually the case. This no doubt accounts for the large amount of organic matter which was found in this particular sample, and may explain the excess of zinc in it through non-dilution of the water. The roofs at Kuala Lipis are covered with white patches of oxide of zinc.

The amount of carbonate in solution in the tank water which caused so much sickness at Kuala Lipis is comparatively small in quantity. It is less than one-fifteenth of that found in the contaminated water supplied to Cwmfelin, near Llanelly, a few years ago.

It is interesting to note in connection with the latter instance, which is reported in the *Lancet* of July 29th, 1893, that the Pahang water was also essentially a soft water. The occurrence of this rather rare instance of poisoning suggests the advisability of a special inquiry with regard to a possible contamination of water in the towns of Australia and South Africa, where galvanised iron roofs and tanks are used for the purpose of collecting and storing rain water; and although soil and circumstances undoubtedly play a chief part in the causation of typhoid fever in these countries, it is not unreasonable to suppose that zinc poisoning might be a factor in the causation of some of the gastro-intestinal symptoms. It appears that only after prolonged boiling and subsequent filtration water containing the acid carbonate of zinc might be harmless. It must be borne in mind, however, that the climates are essentially different, and perhaps in this may be found the determining cause of the Pahang epidemic. The mean annual temperature at Kuala Lipis in 1900

was 82.7° F., the minimum temperature 71° F.; the rainfall 96.69 inches, with an average number of thirteen rainy days per month.

REPORTS BY DR. P. J. BURGESS, Government Analyst.
Government Analyst's Office.
Singapore, April 12th, 1901.

Report on Three Samples of Water, and a Piece of Zinc Gutter sent for Analysis by the Resident Surgeon of Pahang.

The samples were labelled as follows: A, B, C, D, E, and F. Of these A, B, C, D, and E were samples of water in soldered tins. Sample B was a duplicate of A, and sample E a duplicate of D.

Samples of water A, B, D, and E, were taken from the storage tanks, and sample C was taken direct from the roof. Sample F was a wooden box, containing a piece of zinc gutter pipe.

Experimental Results.

A preliminary determination of the quality of the samples as drinking water was made, with the results as given in the attached Report I.

From these results it is shown that the water C is organically a dirty water, and unfit for domestic purposes, while A, B, and D, E, are fit for drinking.

These results, however, cannot be taken as true indications of the quality of the waters, on account of the time that had elapsed during the transit of the samples from the place of collection to this laboratory.

The results obtained by the resident surgeon of Pahang, namely, that zinc was present in the water, were then qualitatively confirmed, and an estimation of the amount of the metal was made. These results are given in Report II.

The water held the zinc in solution as the acid carbonate, and boiling the water in an open dish led to the precipitation of zinc, as the normal carbonate of zinc. The presence of zinc in this case is, in fact, precisely analogous to the frequent and harmless presence of calcium carbonate in waters which are technically termed "temporary hard."

An examination of the zinc gutter F showed that a considerable amount of dust and fine sediment had accumulated in the gutter. When this superficial deposit was removed round patches of a white powder were found closely adherent to the zinc surface. Portions of this powder were collected and analysed, and it proved to contain: zinc, 52.1 per cent.; carbon dioxide, 20.2 per cent. This percentage corresponds to approximately a basic zinc carbonate, and the practical difficulty in obtaining the white powder free from surrounding dust would naturally lead to results showing low percentage of zinc and carbon dioxide.

An analysis of the loose brown dust in the gutter was then made, and it was found to consist approximately: matter, insoluble in strong acids, 70 per cent.; zinc carbonate, 5 per cent.; ferric oxide, 9 per cent. Moisture and other soluble matter were present. Only an approximate analysis of this dust was made, because the composition varied with the mode of removing it from the gutter. The results, however, are sufficient to show that the dust contained considerable quantities of zinc salt.

Conclusions.

There can, from the foregoing results, be no doubt that the water under examination is contaminated with zinc, and the amount is sufficient to cause zinc poisoning by long and continued use of the water. The zinc is in actual solution in the water, and filtration would not be efficient in removing the zinc. This is shown by the quantitative results obtained on filtered and unfiltered samples of the water. (*Vide* Report II.)

The source of the zinc has undoubtedly been the zinc

surface over which the water has run during the collection, and the water has been enabled to hold the zinc in solution by being impregnated with carbonic acid.

As this carbonic acid is expelled from the water the zinc is thrown out of solution, and it is to this partial purification of the water by standing, and loss thereby of carbon dioxide, that I attribute the amount of zinc in water A, B, and D, E, being smaller than it is in sample C, which was taken direct from the zinc roof.

I am inclined to believe that, provided the surface of the roofs and gutters were clean, there would be no danger of zinc pollution of the water, and that the immediate sources from which the zinc is derived are the small patches of zinc carbonate, which are found in the gutter, and which I suspect would also be found scattered over the galvanised iron roof.

These patches of zinc carbonate are formed by the action of the decomposition products of organic matter, which may have collected, and have remained lying in the gutters and on the roof.

REPORT I.

Samples.	A	B	C	D	E
Chlorine (grain per gallon) ..	0.56	0.700	0.560	0.28	0.420
Free ammonia (parts per million) ..	0.07	0.128	0.420	0.01	0.000
Albuminoid ammonia (parts per million) ..	0.04	0.66	0.182	0.11	0.104

REPORT II.

Samples.	A, B	C	D, E
Total solid residue (parts per million) ..	72.80	52.80	45.70
Total solid residue in filtered water (parts per million) ..	46.00	34.20	16.00
Zinc (parts per million) ..	4.82	11.15	3.35
Zinc, in filtered water (parts per million) ..	4.25	8.90	2.20
Iron (parts per million) ..	7.09	19.36	2.80

The remainder of the solid residue consisted of organic matter, salts of sodium and potassium, and traces of lime.

THE OCULAR LESIONS OF LEPROSY.

By M. T. YARR, Major, R.A.M.C.

A COMMUNICATION on this subject was read at the recent Pan-American Medical Congress, held at Havana, by Dr. Patron-Espada, of Yucatan. The following are the more important points to which he draws attention:—

Leprous lesions are almost exclusively confined to the anterior segment of the eye. The cornea may be attacked either by discrete lepromas or by a general interstitial infiltration; these diseased conditions sometimes give rise to a secondary glaucoma. The iris is occasionally the seat of a hitherto undescribed manifestation—numerous grey spots the size of small pins' heads, without surrounding inflammatory reaction or alteration in the colour of the unaffected iris; this peculiar form of iritis is occasionally, not commonly, followed by synechiæ. The author also describes the usual plastic iritis, and the lepromas of the iris and ciliary body, so often seen in lepers. He states he has found no retinal or choroidal lesion in the numerous cases he examined. Dr. Finlay, of Havana, in commenting on the paper, said 60 to 70 per cent. of

the patients in the Havana leper asylum presented ocular lesion, and drew attention to the importance of loss of eye-brows as an early premonitory sign of ocular complications.

Dr. Patron-Espada is incorrect in stating that the "miliary iritis" above alluded to had not been previously described. In the exhaustive monograph on Ocular Leprosy, by MM. Jeanselme and Morax, a translation of which I published in 1899,¹ the following passage occurs:—

"In two of our patients we observed a form of iritis which we have not seen previously described, and which seems pathognomonic of leprosy. The surface of the iris in these cases appeared speckled with tiny grey points which could only be made out distinctly with the aid of a lens; these spots were scattered all over the iris, but were much more numerous near the sphincter; on a small scale they resembled the eruption of miliary granulations seen in certain forms of tubercular iritis. In one case the pupillary reaction was normal; in the other there were strong posterior synechiæ. In a third patient the same miliary nodules were present, but limited to a small area of the iris."

The assertion that leprosy lesions are almost exclusively confined to the anterior segment of the eye is probably only correct clinically: I mean that fundus lesions are by no means unknown, but it is very unusual for observers to diagnose them during life as corneal opacities and pupillary exudates so frequently render ophthalmoscopic examination impossible. An interesting case in which choroido-retinal changes were detected during life was recorded in these columns in the JOURNAL of October, 1899.

THE CONTAGION OF TRACHOMA.

STRAUB (*Klinische Monatsblätter für Augenheilkunde*) endeavours to show that trachoma is very contagious amongst children and only slightly so amongst adults; in other words, that the predisposition to the disease diminishes with advancing age.

Hoppe, in the same journal, contests Straub's conclusions vigorously. He examined the entire population of certain villages in Eastern Prussia where trachoma is rife and obtained the following statistics:—

Age.	Proportion of trachoma	Per cent.
1 to 12 months.		3.4
1 " 6 years.	" "	6.17
6 " 14 "	" "	10.35
14 " 21 "	" "	13.04
21 " 95 "	" "	7.06

From these figures it is seen that the proportion of trachomatous persons to the general population is not at its highest at or before the school period, but some years after its termination, the curve of incidence in Hoppe's full figures showing the maximum between 18 and 21 years. The rarity of new infections after 21 is explained by the fact, according to Hoppe, that the principal source of infection must be traced to the family and to living with infectious persons.

¹ "The Ocular Manifestation of Leprosy," by MM. Jeanselme and Morax. Translated and edited by M. T. Yarr, F.R.C.S.I. (Bale, Sons and Danielsson, Ltd.).

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THE

Journal of Tropical Medicine

DECEMBER 16, 1901.

FITNESS FOR TROPICAL LIFE.

At the meeting of the Medical Society of London, on Dec. 9th, Dr. Alexander Crombie, Lieut.-Colonel, I.M.S. (retired), brought up this subject for discussion. Dr. Crombie's long acquaintance with the European in India entitles his remarks and opinions to respect, and the valuable information he communicated to the Society was duly appreciated. He stated that climate as climate takes but a small part in the etiology of disease amongst European immigrants to the tropics. It is rather the accidents incidental to life in the tropics that bring illness, and were such diseases as cholera, malaria, &c., eliminated from the tropical and sub-tropical zones, the mortality statistics of the tropics would compare favourably with those

of temperate climates. Dr. Crombie was careful, however, to state that this was true only *for a time*. For a time the healthy European was capable of resisting the baneful influences of excessive heat and moisture; for a time, in fact, the heat serves as a stimulant. It increases the activity of the chylipoietic viscera more particularly; it heightens even mental activity and so-called vital energy; but only for a time. In course of time a perceptible alteration appears; and amongst the less physically fit it appears early. The balance between thermogenesis and thermolysis is the physiological factor which the body of the European is called upon to maintain. In high atmospheric temperatures but little thermogenesis is necessary, and the question of the disposal of the body heat produced under such circumstances comes to be one of considerable physiological difficulty.

When the temperature of the air approximates the normal temperature of the body radiation of heat from the body diminishes, and when the temperature of the air exceeds the body temperature all radiation of heat ceases and the balance of the economy, as regards heat, is controlled by the nervous system. But the calls upon the nervous system in time tends to exhaustion, and the inevitable result is digestive upset.

To lowered power of digestion succeeds the train of symptoms which is but too well known in warm climates: neurasthenia, dilatation of the stomach, tendency to sleep after, or even at, dinner, when reading, or at any period of the day, be the occupation what it may. A craving for food, yet a repugnance of the same, a desire for alcohol, for aerated waters, &c., all indicate a lowered vitality and perversity of function.

Dr. Crombie particularly warns obese people against going to the tropics, and those possessed of inherited or acquired mental instability. Concerning the latter it is peculiarly important that the family history of candidates for the Indian Civil or Forestry departments should be carefully enquired into. In the Civil Service the long and severe mental application necessary before obtaining a place in the service, together with great responsibility afterwards at an early age, and

frequently trying isolation, combine to try the mental stability, and where there is any suspicion of deterioration in this respect such men ought not to be allowed to enter the service. In the Forestry department a life of isolation, and want of contact with Europeans for long periods together, is calculated to develop insanity in men whose mental balance tends towards unstableness. In fact, the only man who can with safety be sent to the tropics, and who can maintain good health *for a time*, is one in whom no flaw exists in his mental or physical condition.

The effect of this upon the nation has to be thought of. Only the strong men are taken; the physically or mentally unfit are left behind. We may well ask in what condition are the strong young men we give to serve the Empire sent back to us. Are we draining the strength of the nation beyond its powers to supply our Imperial needs? Tropical life is well enough *for a time*, but beyond that *time*, whatever its duration is, what then? This, however, is a question with which those who provide the supply of candidates for the public services have not to do; but it is one which we, as a people, having regard to the national health, may well carefully weigh.

ANOTHER LIVERPOOL MALARIAL EXPEDITION FOR WEST AFRICA.

ON Saturday, November 30th, Mr. Charles Balfour Stewart, M.B., who has been engaged in research work for some years in the Thompson-Yates Laboratories and elsewhere, sailed for West Africa in order to study malaria under the auspices of the Liverpool School of Tropical Medicine. He will first proceed to Freetown, to study the methods at present employed there with marked success by Dr. Logan Taylo, and will then endeavour to cope with the disease in Cape Coast Castle, where it is said to be responsible for a considerable mortality among Europeans at the present time. He will have full charge, under Major Ross's directions, of the operations on the Gold Coast, and will probably before long be furnished with assistants. His methods will mainly be those which have already been found satisfactory in Freetown and other places, viz., drainage of the ground, and the removal by gangs of workmen of broken vessels and other articles in which water can lodge about houses, and form breeding-grounds for mosquitoes, and attention to the general sanitary conditions of the locality.

Mr. Stewart has been engaged by the Liverpool School for one year, but he will probably remain as

long as his services are required to carry on the work in the important Gold Coast Colony. After a short time he hopes to be able to pay special attention to the health conditions of the gold mines, and the School has instructed him to visit the mining districts where possible.

His movements will, however, be largely determined by the wishes of the Governor of the Gold Coast. Anti-malaria operations will then be in full swing all down the West Coast of Africa, from Gambia to Lagos, three of the colonies, Gambia, Sierra Leone, and the Gold Coast, being dealt with by the Liverpool School of Tropical Medicine.

Mr. Stewart, who was formerly a student and a house physician in the Liverpool Royal Infirmary, has already had a considerable experience of practice in tropical regions, having worked both up country in India at the plague, and in the Malarial Research Laboratory, at Bombay, where he was assistant to Haffkine. For this work he received the thanks of the Governor and Council. Since his return to England he has been engaged in the preparations of plague prophylactic serum, by request of the Secretary of State for War, and the Agent-General of Cape Colony. He would have sailed for the West Coast a fortnight earlier had it not been for the occurrence of a few plague cases in Liverpool, where his services were specially retained by the Liverpool Corporation, to assist in coping with the disease.

News and Notes.

SIR FRANCIS LOVELL, K.C.M.G., arrived in Bombay on November 13th. The public papers in India have extended a hearty welcome to Sir Francis, and there is every prospect that his mission on behalf of the London School of Tropical Medicine will be eminently successful in India.

MEDICAL HONOURS IN INDIA.—We beg to congratulate the following recipients of honours which appeared in the *Gazette of India Extraordinary*, on November 9th:—

INDIAN EMPIRE COMPANION.

George Hart Desmond Gimlette, I.M.S.

KAISER-I-HIND GOLD MEDAL.

Lieut.-Colonel James McCloghry, F.R.C.S.I., I.M.S., Civil Surgeon, Karachi.

Major Herbert Edward Deane, R.A.M.C., Special Health Officer, Calcutta.

Captain Edmund Wilkinson, F.R.C.S., I.M.S., Deputy Sanitary Commissioner, Punjab.

KAISER-I-HIND SILVER MEDAL.

Captain John Norman MacLeod, M.B., I.M.S., Civil Surgeon, Bikanir, Rajputana.

Miss J. Yerbury, M.D., Lady Lyal Hospital, Agra, North-Western Provinces.

Assistant-Surgeon Julius Augustus Lobo, Residency Assistant Surgeon, Persian Gulf.

THE following appointments have been made in the Medical Staff in India: Surgeon-General Price, to

officiate as P.M.O., His Majesty's Forces in India; Surgeon-General Eaton, to officiate as P.M.O., Bombay Command; Colonel Burnett, to officiate as P.M.O., Bengal Command.

CHOLERA.—An outbreak of cholera prevailed in Oudh during the month of November. Cholera so late in the season is exceptional, and the advance of the cold weather is sure to curtail the disease. Lucknow appears to have been the city most seriously affected, twenty to forty deaths from the disease having occurred daily for some days during the second week of November. Lucknow would appear to be sadly behind as regards sanitation, and the recent outbreak may hasten the completion of the drainage scheme which has been contemplated for some time.

Current Literature.

DYSENTERY.

DYSENTERY IN THE PHILIPPINES.

By M. H. BOWMAN, M.D.

Acting Assistant Surgeon United States Army.

THE article of Dr. Cruikshank in the *New York Medical Journal* for March 9th and 16th regarding the treatment of acute dysentery impels me to give the *Journal* some observations on dysentery in the American army of occupation. If the "specific treatment of acute dysentery" has been discovered at last, it is one of the greatest boons which have ever fallen to nations. The mortality from this disease during the civil war was probably not greater than it is under similar conditions at the present time. Witness its frightful mortality for the last twenty years in Japan, and the report just published by Assistant-Surgeon R. P. Strong: "Of 1,830 cases of dysentery admitted into the First Reserve Hospital in sixteen months, not more than one-third (621) have been returned to duty." It would be interesting to learn the subsequent history of this gallant remnant as to how many have had relapse, since it is notorious that the amœbic form is prone to recur time and again after apparent recovery. The researches of Assistant-Surgeon Strong, President of the Board of Investigation of Tropical Diseases in the Philippines, have been of such a character that it can be said:—

(1) Dysentery as it is seen here is not a single, but two distinct and separate diseases.

(2) Acute dysentery is caused by the bacillus of Shiga.

(3) Acute dysentery does not produce abscess of the liver, nor does it produce ulceration of the colon. Its fatal result is due to inflammation of the bowel, rapid elimination of the water fluids of the body, toxæmia, and exhaustion, much after the manner of cholera, though requiring four, six, and twelve days before its termination or crisis.

(4) Amœbic dysentery differs from acute dysentery anatomically, pathologically, and etiologically. The only similarity between them is, the colon is the locus minoris resistentiæ for both the bacillus of Shiga and

the amœba. Here all similarity ends. The bacillus of Shiga leaves no other lesion behind, save its effect upon the mucous membrane of the colon and enlargement of the adjacent glands. The amœba of dysentery invades the three layers of the colon, producing punched out ulcers or ulcers with undermined edges. It also passes to the liver and produces characteristic lesions. There are two varieties of the amœba which differ in no respect save as to size. The pathogenic variety is somewhat larger than the non pathogenic. These two varieties of amœba have been the cause of all the confusion regarding the amœba as an etiological factor in amœbic dysentery. After the publication of the work of Councilman and Lafleur, observers discovered amœbæ in non-dysenteric cases, and at once cast doubt upon the correctness of the above-named observers. The researches of Lieutenant Strong have been of very great value in clearing the troubled waters of doubt about these amœbæ. Until very recently the trend of medical thought has been towards the conclusion that the ætiology of dysentery was due to no one micro-organism in particular, but the resultant energy of a combined attack, that the amœbæ were accidental factors in the disease, and not an etiological one.

At times amœbæ have been found in liver abscesses; again, they have been absent while various other micro-organisms were present, which only added to the general confusion and doubt. The liver abscess is not a true abscess. In no sense does it resemble an abscess produced by pus-producing organisms. Hence it is an abscess from which all pus-forming bacteria may be excluded as an etiological factor. In his experiments upon cats, animals very susceptible to amœbic dysentery, Strong found that amœbæ from non-dysenteric cases produced no effects upon them, while the amœba from dysenteric liver abscesses, in pure culture, invariably produced the characteristic colon lesions of amœbic dysentery. These observations have been previously made by other investigators. The chief value of Lieutenant Strong's observations has been to separate the amœbæ into the pathogenic and non-pathogenic, eliminating the confusion which had grown up about the amœba in non-dysenteric cases. He has also confirmed Shiga's observation regarding the *Bacillus dysentericæ*.

TO SUM UP THE DIFFERENCE BETWEEN ACUTE AND AMÆBIC DYSENTERY.

Acute dysentery is caused by the bacillus of Shiga, a bacillus belonging to the typhoid group. It is constantly present in acute dysentery, and is the only persistent organism present. The bacillus of Shiga has produced typical acute dysentery in man, given in free culture, by the mouth, and been recovered from the stools. The bacillus of Shiga is not pathogenic to any of the lower animals, whether given by the mouth or injected *per rectum*. It is pathogenic, when injected subcutaneously or intraperitoneally into mice, rats, and guinea-pigs, and causes death by toxæmia. The blood serum of those attacked with acute dysentery almost invariably agglutinates the bacillus of Shiga. The period of incubation is forty-eight hours. The onset of the attack is sudden and fulminating in character. The brunt of the attack is

on the colon. It never produces ulceration of the colon or of the liver. Its fatal result is due to infection of the mucous membrane of the colon, rapid elimination of the fluids of the body, toxæmia, and exhaustion. The bacillus of Shiga is not found in amœbic cases of dysentery. The brunt of the attack may be at the hepatic flexure, the splenic flexure, or the sigmoid flexure of the colon, or the whole extent of the colon may be filled with ulcers like a sieve. These varied locations have often been observed by the writer while doing *post-mortem* work in China. The abscess of the liver may be single or multiple. I have observed them more frequently multiple than otherwise. The blood serum of those attacked with amœbic dysentery does not agglutinate the Shiga bacillus. As to just what part the accessory bacteria play in both the acute and amœbic forms of dysentery it is impossible to form a conjecture. It is equally difficult to estimate the rôle of the colon bacillus and the staphylococcus in a case of typhoid fever. But we accept the typhoid bacillus as the main factor in this affection. It is also as clearly proved that the bacillus of Shiga and the amœbæ are the fundamental factors in the production of their respective lesions in dysentery. Acute amœbic cases of dysentery often run a rapid course. Symptomatically, it is difficult to distinguish between this and acute dysentery, but microscopically, the amœbæ are found often in great abundance. In these cases it is surprising with what rapidity the amœbæ burrow into and produce large patches of multiple abscesses of the colon, of the size of the hand or half its length. In these areas there may be a patch of the size of a dollar or many times larger of broken-down gangrenous intestine with one or more perforations. There is another picture of this disease which is seen particularly in the robust and strong men, those in whom we least expect to find serious trouble. They usually come on sick report for a trifling diarrhœa, and the usual treatment is given. In a few days they return to duty, feeling perfectly well. They do not lose flesh, and they have not the appearance of being sick. There are alternately a diarrhœa of a few days' duration and a variable period of normal condition or, rather, of constipation. A brief history of one of these cases will show the insidious character of this form of amœbic dysentery, from which a very large percentage of the men are disabled and have to return to America.

Private B., Company E., Sixth U.S. Infantry, arrived in Negros from the United States in July, 1899. In July, 1900, was in hospital one month for diarrhœa; returned to hospital in November, 1900, for diarrhœa; in February, 1901, was again in hospital for diarrhœa, returned to duty in a week, and came to hospital May 26, 1901, for diarrhœa. This is the history given by the patient, and not the diagnosis from hospital records. He weighed 160 lbs., had a good colour, had lost no flesh, and from outward appearances was in the best of health. Physical examination showed the left lobe of the liver decidedly enlarged. The abdomen was normal, with no pain or tenderness on pressure. The stools were disagreeable, foul-smelling, with considerable blood and mucus. Microscopical examination showed large numbers of amœbæ. Some of the amœbæ con-

tained as many as fifteen red blood-corpuscles. The temperature was subnormal in the morning, with an elevation of from a half to one degree in the evening.

During the periods of constipation there is likely to be jaundice; especially is the icteric tint observed in the eyes. The digestion does not suffer until late in the disease. When digestive disturbances supervene the patient fails rapidly. This is the common history of a very large percentage of those who are attacked with amœbic dysentery. A rigid examination of the stools in every case of diarrhœa is the only possible way to detect these latent and insidious forms of amœbic dysentery.

With the evidence here before us of the unquestioned duality of the disease proved beyond cavil by the anatomical lesions, the experimental work with the bacillus of Shiga and with the amœba, as well as therapeutical experience, it is something of a surprise to read Dr. Cruikshank's insistence upon the unity of the disease and the specificity of treatment. The citation of Dr. Buchanan Smith and Dr. Dickey's experience with the sulphate of magnesium treatment affords little ground upon which to base an argument; 555 cases treated with magnesium sulphate, with only six deaths, looks well in print. In none of these cases was there a microscopical examination or were cultural growths taken. The so-called catarrhal form of dysentery is often mistaken for acute dysentery. In this catarrhal form the patient usually recovers, whether he is treated or not. The 555 cases cited were probably of this nature. At most, it is hardly fair to insist upon our accepting them all as acute dysentery upon the evidence submitted. The recovery from acute dysentery depends upon three important factors: (1) The virulence of the bacillus of Shiga; (2) the physical condition, susceptibility or non-susceptibility of the individual; (3) nursing, nourishment, and rest.

If the bacillus is particularly virulent, the patient will as surely succumb as if he had a virulent type of cholera. If it is not so virulent, and the patient is in poor physical condition, he will hardly sustain the attack, but if he is in fair physical condition and properly cared for, his chances for recovery are good. There are undoubted degrees of susceptibility among the soldiers, as well as degrees of virulence of the organism itself. We owe much to this fact.

TREATMENT.

Medicine in no way seems to influence the course of the disease. It runs its course to the end. We have no power as yet to abort the disease. To sustain the patient through the attack seems to be the only rational treatment. To aid in depleting his system of all the fluids of the body, as the disease itself is doing, is no more rational than to make use of the same means in the treatment of cholera. Hypodermolysis and rectal enemata of mild astringents and sedatives are of unquestioned value. Amœbic dysentery, on the other hand, presents to us both a darker and a brighter prospect than the acute form. If it is recognised in its early stages before the amœbæ have penetrated deep into the tissue of the intestine, and possibly entered the circulating channels and reached the liver, it offers much hope, but if rapid

ulceration is forming, it is a question whether we can reach the amœbæ and arrest their progress before perforation or necrosis takes place. If the amœbæ invades the liver, few patients recover from the almost necessary operation which sooner or later must follow. In this form of dysentery magnesium sulphate is not indicated. Quinine solution effectually destroys the amœba. If the attack is severe, the condition of the intestine is such that it can scarcely retain the solution, the remedy proves useless. Many cases, however, are on record in which quinine solution proved highly efficacious, and its therapeutic action is unquestioned. In contrast with this gloomy prognosis comes the reassuring note from Dr. Cruikshank about the aperient sulphates. In what way can the sulphates affect the amœbæ or the bacillus of Shiga?

Beneath the adherent mucous exudate upon the surface of the colon, in acute dysentery, the bacillus of Shiga can never be removed or influenced by aperients or purgatives. In the amœbic form the amœbæ bury themselves in the submucous and muscular tissue of the colon, and are as little influenced by aperients as is the typhoid bacillus which, having entered the walls of the intestine, has passed on to the mesenteric glands and spleen. It is agreed, I infer, that the intestinal canal cannot be disinfected. It would be a grievous mistake to make use of this remedy in cholera, yet the condition of the colon in the acute dysenteries contraindicates the use of the sulphates more decidedly than it does in cholera. Since the colon is pathologically more gravely affected than the intestines in the latter disease, they the more loudly call for rest. Finally, the aperient sulphates have been tried time and again and found wanting in every particular. Regarding the dysenteries produced by the Shiga bacillus and amœbæ, I submit the following considerations:—

- (1) The duality of dysentery is proved.
- (2) Acute dysentery is the result of infection with the bacillus of Shiga.
- (3) It is infectious in the same way that the bacillus of typhoid fever is infectious.
- (4) Amœbic dysentery is caused by an amœba.
- (5) There are both a pathogenic and a non-pathogenic amœba, which fact has produced much confusion regarding the amœbæ as an etiological factor.
- (6) The lesions of amœbic dysentery differ from those produced by the bacillus of Shiga.
- (7) The therapeutic agents generally used for the treatment of acute dysentery are in no way curative.
- (8) Magnesium sulphate should be included in this list.
- (9) Quinine solution is a specific for the amœbic dysentery, but its employment in rapid, acute, ulcerating cases is fraught with danger, and from the nature of the lesions it cannot be retained for a sufficient length of time to produce beneficial effects.—*New York Medical Journal*.

THE Government of India intend establishing a large bacteriological research institute with a laboratory at Parel, under Dr. Haffkine, who will be known as Director of Bacteriology.

EXCHANGES.

Annali di Medicina Navale.
 Archiv für Schiffs u. Tropen Hygiene.
 Archives de Medicine Navale.
 Archives Russes de Pathologie, de Médec., Clinique et de Bacteriologie.
 Australasian Medical Gazette.
 Boletín de Medicina Naval.
 Boston Medical and Surgical Journal.
 Bristol Medico-Chirurgical Journal.
 British and Colonial Druggist.
 British Journal of Dermatology.
 British Medical Journal.
 Brooklyn Medical Journal.
 Caducée.
 Climate.
 Clinical Journal.
 Clinical Review.
 Giornale Medico del R. Esercito.
 Hong Kong Telegraph.
 Il Policlinico.
 Indian Engineering.
 Indian Medical Gazette.
 Indian Medical Record.
 Janus.
 Journal of Balneology and Climatology.
 Journal of Laryngology and Otology.
 Journal of the American Medical Association.
 La Grèce Médicale.
 Lancet.
 Liverpool Medico-Chirurgical Journal.
 Medical Brief.
 Medical Missionary Journal.
 Medical Record.
 Medical Review.
 Merck's Archives.
 New York Medical Journal.
 New York Post-Graduate.
 Pacific Medical Journal.
 Polyclinic.
 Public Health.
 Revista de Medicina Tropical.
 Revista Medica de S. Paulo.
 Sei-i-Kwai Medical Journal.
 The Hospital.
 The Northumberland and Durham Medical Journal.
 Treatment.

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2.—Manuscripts sent in cannot be returned.

3.—As our contributors are for the most part resident abroad, proofs will not be submitted to those dwelling outside the United Kingdom, unless specially desired and arranged for.

4.—To ensure accuracy in printing it is specially requested that all communications should be written clearly.

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*BIHYDROCHLORATE	72.0 %	" 1 "	1.02
HYDROBROMATE	76.6 %	" 45 "	.96
*BIHYDROBROMATE	60.0 %	" 7 "	1.23
BISULPHATE	59.1 %	" 11 "	1.24
PHOSPHATE	72.8 %	" 78 "	1.01
VALERIANATE	75.7 %	" 110 "	.97
*LACTATE	78.2 %	" 10 "	.94
SALICYLATE	70.1 %	" 225 "	1.05
*HYDROCHLOROSULPHATE ...	74.3 %	" 2 "	.99
ARSENIATE	69.4 %	slightly soluble	1.06

* These are suitable for Hypodermic Injections.

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The Malarial Mosquito in Hongkong.

FROM THE

"CHINA OVERLAND TRADE REPORT."

The accompanying notes concerning the existence of the Malarial mosquito in Hongkong were read by Mr. C. V. Ladds at a meeting of the South China Branch of the British Medical Association on Monday evening:—

In a Circular Despatch from the Right Honourable the Secretary of State for the Colonies, dated December 6th, 1893, His Excellency the Governor was requested to forward to the Colonial Office a collection of mosquitoes from the colony with a view to investigating the possible connection of Malaria with this genus of insect.

Two collections were forwarded as requested upon August 18th and November 24th respectively, and none of the species *Anopheles* having been included in these collections it was thought at that time that they did not exist in Hongkong. Having always taken a great interest in the Malaria question, and not being satisfied with the result obtained during the above investigation, I determined to take up the subject privately, and commenced work in December, 1893.

After going thoroughly into the matter, and after having cultivated the larvæ of many varieties of mosquito, I at length found that the *Anopheles* undoubtedly did exist in the colony and was to be found in most of its known malarial districts. I first discovered them close by a Government bungalow at Kennedy Town. The different occupants of this house having been subject to repeated attacks of fever ever since its erection in 1895, I determined to make this place my starting point, and after a very careful examination, I found a small pool swarming with *Anopheles* larvæ within fifty yards of the building.

Extending my search I found the same species near the Kennedy Town Fever Hospital, at Magazine Gap, at Wong-nei-cheong village, near a house on Bonham Road, at Quarry Bay, close by the Taikoo Sugar Refinery, all round the camp of the Welsh Fusilier detachment at Kowloon, and in many other places.

This being sufficient evidence of their existence over a considerable area of the colony, and having now no doubt that they were to be found in all the malarial districts, I next proceeded to examine the particular kind of pool which the *Anopheles* appeared to select as most suitable for the propagation of its species.

A small shallow pool containing algae, or green flocculent water-weed, and fungoid growths, abounding in all kinds of aquatic insect life, and which is not quite stagnant (or if stagnant at the time of discovery is not likely long to remain so, but is renewed occasionally by small flushes of rain water), appears to be their favourite *habitat*.

In nearly every instance I found them only in such pools, which were in most cases fed by minute streams issuing from small springs in the hill side, and these not being of sufficient volume to scour out a channel of their own, just spread themselves over the surrounding lower ground, and so help to form and feed the typical *Anopheles* pool.

They do not seem to inhabit pools which are entirely stagnant (or likely to remain so long) or which contain no water-weed; and appear to be particularly careful in their selection, as, although there may be dozens of pools in the locality, only a few of them may contain *Anopheles*.

Having repeatedly found the mosquito hovering round a pool which contained the same species of larvæ, it is probable that the adult insect returns to its original home to deposit its eggs, and this theory may, if correct, account in a measure for their not being found scattered indiscriminately about everywhere. After once seeing the particular kind of pool which these mosquitoes affect it is easily recognised, but it is not quite so easy to describe it correctly; yet I trust that I have given a fair general idea of what to look for.

I find by experimenting that the *Anopheles* larvæ appear to feed upon the algae or water-weed which is found in their particular pools, and also possibly upon some of the animalculæ which they contain. This I proved by placing some larvæ in clear tap water and others in water taken from an *Anopheles* pool which contained water-weed; those in the former dying quickly, while those in the latter hatched out in due course. I should not say that the larval stage of the insect is a long one, probably about a week to ten days, this depending a good deal upon the nature of the pool; after which time they emerge therefrom as adult mosquitoes. The life of the mosquito itself probably extends over a period of several weeks, perhaps longer.

I have so far not succeeded in finding the *Anopheles* larvæ in any of the healthy districts of the colony, or far distant from human habitations, nor have I yet found them in rice fields, in large pools of water, in rapidly running streams, in pools with sandy bottoms, in wells, old broken pottery, tubs, pans, &c., as in the case of *Culex*, which may be found in almost anything which contains water.

In contradistinction to the *Anopheles*, water-weed does not seem to be necessary to the existence of the *Culex* larvæ, they being often found in pools, &c., from which it is entirely absent. A further distinction between the two species being that the former appears to be much more delicate than the latter. It is not necessary here to describe the *Anopheles* larva or mosquito, they being so entirely different from the other species as to be easily recognised after having been once seen. Having satisfied myself as to the existence of the *Anopheles* in the colony, and having given a brief description of its *habitat*, &c., I will now pass on to the possibilities of its extirpation from the island. With this object in view, I have been testing the effects of various insecticides. I found that kerosene used as described by the African Commission was very effective in still pools, or in those which were temporarily stagnant; gas tar also proved to be very useful, but in my opinion **Jeyes' Fluid** is the best of those which I have tried up to the present.

So far as my experiments have gone, I find that one part of **Jeyes' Fluid** to 10,000 of water kills both *Anopheles* and *Culex* larvæ in a few hours, very much weaker solutions destroying them after a longer interval.

Potassium permanganate appears to be of very little use. In a solution of 1 to 1,200 of water, equal to one in five of Condry's Fluid, the larvæ lived for twenty-four hours, and were as lively as ever at the end of that time, while in a solution of 1 to 500, equal to nearly one in two of Condry's Fluid, they lived for four hours without there being any appreciable effect upon them, and even after twenty-four hours more than half of them were alive.

Hence by treating all *Anopheles* resorts frequently with **Jeyes' Fluid**, kerosene, or gas tar, during the whole of the dry season, when such pools are comparatively scarce, and by paying particular attention to surface drainage in malarial districts, much might be done towards effecting their partial, if not total, extermination.

In conclusion, I think I may safely say that by working upon these lines, and given the services of half-a-dozen intelligent coolies, some one to look after them, and the necessary supplies of the above-mentioned chemicals, in a very short time it would be possible to cause the *Anopheles* to become so scarce in Hongkong that should they prove to be the only source of infection by malaria, cases of malarial fever would soon be as rare as cholera, and the finding of the *Anopheles* larvæ in any part of the island as difficult a matter as looking for the proverbial needle in a truss of hay.

“The Journal of Tropical Medicine”

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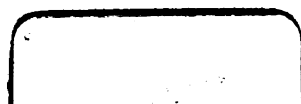
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